Panasonic

Owner's Manual for advanced features

Digital Camera

Model No. DMC-GH3



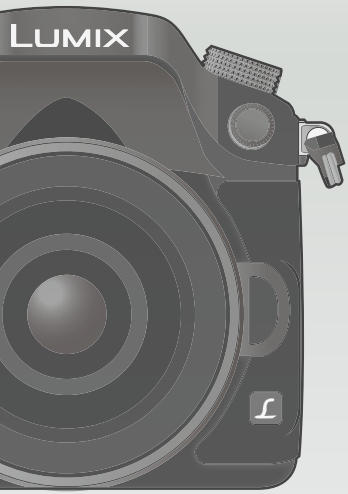
Please read these instructions carefully before using this product, and save this manual for future use.

Register online at
www.panasonic.com/register
(U.S. customers only)

VQT4M60
F1012MC0

Finding the information you need

GH3



In this “Owner’s Manual for advanced features”, you can find the information you need from the following pages. By clicking a page number, you can jump to the linked page and quickly find the information.

Search from “Contents” P3 ~

Search from “Names and Functions of Components” P11 ~

Search from “Monitor Display/ Viewfinder Display” P270 ~

Search from the list of on-screen messages P274 ~
“Message Display”

Search from the menu list P278 ~
“Menu list”
[Rec] P278
[Motion Picture] P280
[Custom] P281
[Setup] P283
[Playback] P285

Search from “Troubleshooting” P286 ~

Contents

Finding the information you need 2

Before Use

Care of the camera 9
Standard Accessories 10
Names and Functions of Components 11
About the Lens 19

Preparation

Changing the Lens 20
Attaching the Shoulder Strap 22
Charging the Battery 24
- Charging 24
- Approximate operating time and number of recordable pictures 26

Inserting/Removing the Battery 29
Inserting/Removing the Card (Optional) 30
About the Card 31
- About cards that can be used with this unit 31
- Formatting the card (initialisation) 32
- Approximate number of recordable pictures and available recording time 33

Setting Date/Time (Clock Set) 35
- Changing the Clock Setting 36

Setting the Menu 37
- Setting menu items 37

Calling frequently-used menus instantly (Quick Menu) 39
- Change the Quick Menu to your preferred item 41

Assigning frequently used functions to the buttons (function buttons) 42
Configuring basic settings of this unit (Setup Menu) 45
Setting your preferred operation methods ([Custom] Menu) 53
Entering Text 64

Basic

Tips for taking good pictures 65
- Detects orientation of camera (Direction Detection Function) 65

Using the Viewfinder 66
- Switching the Monitor/Viewfinder 66
- About the Eye Sensor AF 67
- Setting the focus position with the Touch Pad 67

Taking a Still picture 68
- Taking pictures using the Touch Shutter function 70

Recording Motion Picture 71
Switching the Information Displayed on the recording screen 72
Playing Back Pictures/Motion Pictures 75
- Playing Back Pictures 75

• Playing Back Motion Pictures 78
• Creating Still Pictures from a Motion Picture....79
• Playing Back Group Pictures 79
• Changing the information displayed on the playback screen....81
Deleting Pictures 82

Recording

Selecting the Recording Mode 84
Taking Pictures with Your Favorite Settings (Program AE Mode) 85
Taking Pictures by Specifying the Aperture/Shutter Speed 87
• Aperture-Priority AE Mode 87
• Shutter-Priority AE Mode 88
• Manual Exposure Mode 89
• Confirm the Effects of Aperture and Shutter Speed (Preview Mode)....91
Taking Pictures that match the Scene being recorded (Scene Guide Mode) 92
• [Clear Portrait]....93
• [Silky Skin] 93
• [Backlit Softness] 93
• [Clear in Backlight]....94
• [Relaxing Tone] 94
• [Sweet Child's Face] 94
• [Distinct Scenery]....95
• [Bright Blue Sky] 95
• [Romantic Sunset Glow] 95
• [Vivid Sunset Glow]....95
• [Glistening Water] 96
• [Clear Nightscape] 96
• [Cool Night Sky] 96
• [Warm Glowing Nightscape]....97
• [Artistic Nightscape] 97
• [Glittering Illuminations]....97
• [Clear Night Portrait] 98
• [Soft Image of a Flower]....98
• [Appetizing Food]....99
• [Cute Dessert]....99
• [Freeze Animal Motion]....100
• [Clear Sports Shot]....100
• [Monochrome]....100
Taking Pictures with different image effects (Creative Control Mode)....101
• [Expressive] 103
• [Retro] 103
• [High Key] 103
• [Low Key] 104
• [Sepia]....104
• [Dynamic Monochrome]....104

• [Impressive Art] 104
• [High Dynamic] 105
• [Cross Process] 105
• [Toy Effect] 105
• [Miniature Effect] 106
• [Soft Focus] 107
• [Star Filter] 107
• [One Point Color] 108
Taking Pictures using the Automatic Function (Intelligent Auto Mode) 109
• Taking a picture with a blurred background (Defocus Control) 112
• Recording images by changing the brightness or color tone (Intelligent Auto Plus Mode) 113
Registering your preferred settings (Custom Mode) 115
• Registering Personal Menu Settings (Registering custom settings) 115
• Recording using registered custom set 116
Optical Image Stabilizer 117
Taking Pictures with the Zoom 119
• Using the Extended Tele Conversion when taking pictures 120
• Zooming using touch operations 122
Taking pictures by using the flash 123
• Changing Flash Mode 125
• Setting to the 2nd Curtain Synchro 127
• Adjust the flash output 128
• Synchronising the output of the built-in flash to the Exposure Compensation 128
• Changing the firing mode (Manual flash/wireless flash) 129
Compensating the Exposure 133
Setting the Light Sensitivity 134
Adjusting the White Balance 136
Taking Pictures with Auto Focus 141
• About the focus mode (AFS/AFF/AFC) 142
• Type of the Auto Focus Mode 143
Taking Pictures with Manual Focus 148
Fixing the Focus and the Exposure (AF/AE Lock) 151
Taking Pictures using Burst Mode 153
Taking Pictures using Auto Bracket 155
Taking Pictures with the Self-timer 157
Using the [Rec] Menu 158
• [Photo Style] 158
• [Aspect Ratio] 160
• [Picture Size] 160
• [Quality] 161
• [Metering Mode] 162
• [Burst Rate] 162
• [Auto Bracket] 162

• [Self Timer] 162
• [i.Dynamic] (Intelligent dynamic range control) 163
• [i.Resolution] 163
• [HDR] 164
• [Multi Exp.] 165
• [Time Lapse Shot] 166
• [Electronic Shutter] 167
• [Shutter Delay] 168
• [Flash] 168
• [Red-Eye Removal] 168
• [ISO Increments] 169
• [Extended ISO] 169
• [Long Shtr NR] 169
• [Shading Comp.] 170
• [Ex. Tele Conv.] 170
• [Digital Zoom] 170
• [Color Space] 171
• [Stabilizer] 171
• [Face Recog.] 172
• [Profile Setup] 176

Motion Picture

Recording Motion Picture 177
• Setting the format, size and frame rate 177
• How to set focus when recording a motion picture (Continuous AF) 180
• Recording Motion Picture 180
• Recording while monitoring camera images 182
• Checking the sound while recording motion pictures 182
Recording still pictures while recording motion pictures 183
Recording motion pictures with manually set aperture value/ shutter speed (Creative Video Mode) 184
• Motion pictures in slow and fast motion 185
• Minimizing operational sounds during motion picture recording 186
Setting the recording method of time code 187
Using the [Motion Picture] Menu 188
• [Rec Mode] 188
• [Rec Quality] 188
• [Exposure Mode] 188
• [Frame Rate] 188
• [Picture Mode] 188
• [Continuous AF] 189
• [Time Code] 189
• [Rec Highlight] 189
• [Ex. Tele Conv.] 189
• [Flkr Decrease] 189
• [Silent Operation] 190

• [Mic Level Disp.] 190
• [Mic Level Adj.] 190
• [Special Mic.] 190
• [Headphone Sound] 191
• [Wind Cut] 191

Playback/Editing

Using the [Playback] Menu 192
• [2D/3D Settings] 192
• [Slide Show] 192
• [Playback Mode] 194
• [Location Logging] 195
• [Title Edit] 196
• [Text Stamp] 197
• [Video Divide] 199
• [Resize] 200
• [Cropping] 201
• [Rotate]/[Rotate Disp.] 202
• [Favorite] 203
• [Print Set] 204
• [Protect] 205
• [Face Rec Edit] 206

Wi-Fi

Wi-Fi® function 207
What you can do with the Wi-Fi function 210
[Remote Shooting] 211
• Installing the smartphone/tablet app “LUMIX LINK” 211
• Connecting to a smartphone/tablet 211
• Taking pictures via a smartphone/tablet (remote recording) 213
• Playing back pictures in the camera 213
• Sending location information to the camera from a smartphone/tablet 213
• [Select a destination from History] 214
• [Select a destination from Favorite] 215
Selecting the connection method 217
• Connecting via a wireless access point 217
• Connecting directly 219
[Playback on TV] 220
• Displaying the picture on TV right after taking it/
Displaying the picture on TV by playing it back on the camera 220
[Send Images While Recording] 222
• When sending images to smartphone/tablet 222
• When sending images to PC 225
• When sending images to [Cloud Sync. Service] 227
• When sending images to WEB Service 228
• When sending images to AV device 230

[Send Images Stored in the Camera] **231**
• When sending images to smartphone/tablet 231
• When sending images to PC 233
• When sending images to [Cloud Sync. Service] 234
• When sending images to WEB Service 235
• When sending images to AV device 237
• When sending images to Printer 238
Using "LUMIX CLUB" **239**
• About the [LUMIX CLUB] 239
• Using WEB services 242
• Configuring the external AV device settings 243
How to Use the [Wi-Fi Setup] Menu **244**

Connecting to other equipment

Enjoying 3D pictures **246**
Playing Back Pictures on a TV Screen **250**
• Using VIERA Link (HDMI) 252
Saving still pictures and motion pictures on your PC **254**
• About the supplied software 255
Saving still pictures and motion pictures on a Recorder **259**
Printing the Pictures **260**

Others

Optional accessories **265**
Monitor Display/Viewfinder Display **270**
Message Display **274**
Menu list **278**
• [Rec] 278
• [Motion Picture] 280
• [Custom] 281
• [Setup] 283
• [Playback] 285
Troubleshooting **286**
Cautions for Use **301**

Care of the camera

Do not subject to strong vibration, shock, or pressure.

- The lens, monitor, or external case may be damaged if used in the following conditions. It may also malfunction or image may not be record if you:
 – Drop or hit the camera.
 – Press hard on the lens or the monitor.

The dust- and splash-proofing of this unit is not a guarantee of a full protection against the intrusion of dust and water. Please note the following to optimize the dust-proof and splash-proof performance:

– Use a Panasonic interchangeable lens that supports the dust- and splash-proof design. When you are using an interchangeable lens that does not support the dust-splash proofing or are using the mount adaptor (DMW-MA1: optional), the dust-splash proofing of this unit is disabled.
– Use with the built-in flash closed.
– Securely close each door part, socket cap and terminal cover of this unit.
– When you attach/detach the lens or cap, or open/close the door, make sure to prevent sand, dust, and water droplets from entering the interior of this unit.
– If this unit is exposed to water or other liquids, wipe off the liquid with soft dry cloths after use.

Do not place your hands inside the mount of the digital camera body. Since the sensor unit is a precision apparatus, it may cause a malfunction or damage.

■ About Condensation (When the lens, the viewfinder or monitor is fogged up)

- Condensation occurs when the ambient temperature or humidity changes. Be careful of condensation since it causes lens, viewfinder and monitor stains, fungus and camera malfunction.
- If condensation occurs, turn the camera off and leave it for about 2 hours. The fog will disappear naturally when the temperature of the camera becomes close to the ambient temperature.

Standard Accessories

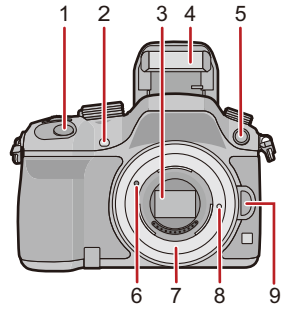
Check that all the accessories are supplied before using the camera.

- The accessories and their shape will differ depending on the country or area where the camera was purchased.
 For details on the accessories, refer to “Basic Owner’s Manual”.
- Battery Pack is indicated as **battery pack** or **battery** in the text.
- Battery Charger is indicated as **battery charger** or **charger** in the text.
- SD Memory Card, SDHC Memory Card and SDXC Memory Card are indicated as **card** in the text.
- **The card is optional.**
- Description in this Owner’s Manual is based on the interchangeable lens (H-HS12035).
- If any accessories are lost, customers in the USA and Puerto Rico should contact Panasonic’s parts department at 1-800-833-9626 and customers in Canada should contact 1-800-99-LUMIX (1-800-995-8649) for further information about obtaining replacement parts.

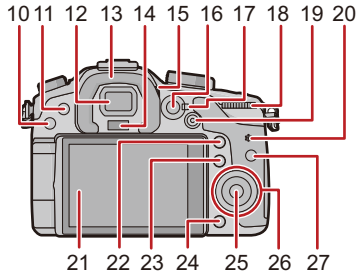
Names and Functions of Components

Camera body

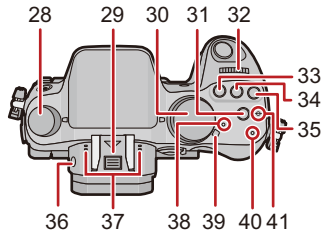
1 Shutter button (P68)
2 Self-timer indicator (P157)/
AF Assist Lamp (P55)
3 Sensor
4 Flash (P123)
5 Flash synchro socket* (P266)
6 Lens fitting mark (P20)
7 Mount
8 Lens lock pin
9 Lens release button (P21)



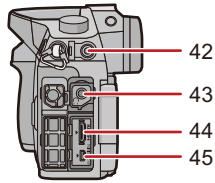
10 [▶] (Playback) button (P75)
11 [LVF] button (P66)/[Fn5] button (P42)
12 Viewfinder (P66)
13 Eye Cup* (P303)
14 Eye sensor (P66)
15 Diopter adjustment dial (P66)
16 [AF/AE LOCK] button (P151)
17 Focus mode lever (P141)
18 Rear dial (P17)
19 Motion picture button (P180)
20 Speaker (P47)
• Be careful not to cover the speaker with your finger. Doing so may make sound difficult to hear.
21 Touch screen/monitor (P15)
22 [Q.MENU] button (P39)/[Fn2] button (P42)
23 [] (Auto Focus Mode) button (P141)/
[Fn3] button (P42)
24 [🗑/↩] (Delete/Cancel) button (P82)/
[Fn4] button (P42)
25 [MENU/SET] button (P18, 37)
26 Control dial (P18)/Cursor buttons (P18)
27 [DISP.] button (P72, 81)



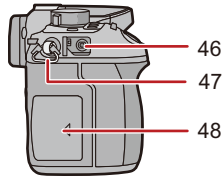
* If you lost the flash synchro socket cap (VKF5108) or eye cup (VYK6B43), please contact the dealer where you purchased the camera or Panasonic.



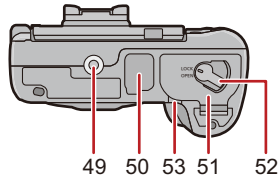
28 Drive mode dial
Single (P68): ▭
Burst (P153): ▭
Auto Bracket (P155): ▭
Self-timer (P157): ⏲
29 Hot shoe (Hot shoe cover) (P265)
30 Mode dial (P84)
31 [Wi-Fi] button (P211)/[Fn1] button (P42)
32 Front dial (P17)
33 [WB](White Balance) button (P136)
34 [ISO](ISO sensitivity) button (P134)
35 [](Exposure Compensation) button (P133)
36 Flash open button (P123)
37 Stereo microphone (P190)
• Be careful not to cover the microphone with your finger. Doing so may make sound difficult to record.
38 Status indicator (P35)
39 Camera ON/OFF switch (P35)
40 Wi-Fi connection lamp (P208)
41 Focus distance reference mark (P150)



42 [MIC] socket (P267)
43 Headphone socket (P47, 182)
44 [HDMI] socket (P250)
45 [AV OUT/DIGITAL] socket (P250, 257, 259, 260)



46 [REMOTE] socket (P268)
47 Shoulder strap eyelet (P22)
• Be sure to attach the shoulder strap when using the camera to ensure that you will not drop it.
48 Card door (P30)



49 Tripod mount (P307)
- A tripod with a screw length of 5.5 mm (0.22 inch) or more may damage this unit if attached.

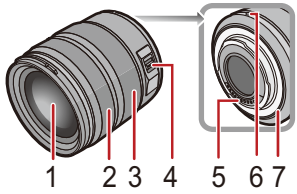
50 Terminal cover*
- Keep the terminal cover out of reach of children to prevent swallowing.

51 Battery door (P29)
52 Release lever (P29)
53 DC coupler cover
- When using an AC adaptor, ensure that the Panasonic DC coupler (optional) and AC adaptor (optional) are used. (P269)

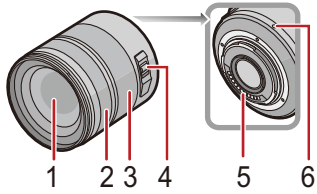
* If you lost the terminal cover (VKF5104), please contact the dealer where you purchased the camera or Panasonic.

■ Lens

H-HS12035
(LUMIX G X VARIO 12–35 mm/ F2.8 ASPH./POWER O.I.S.)



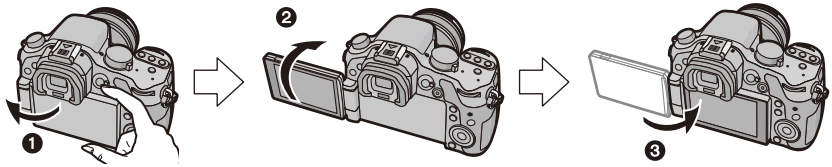
H-VS014140
(LUMIX G VARIO HD 14–140 mm/ F4.0–5.8 ASPH./MEGA O.I.S.)



1 Lens surface
2 Focus ring (P148)
3 Zoom ring (P119)
4 [O.I.S.] switch (P117)
5 Contact point
6 Lens fitting mark (P20)
7 Lens mount rubber (P303)

Monitor

At the time when this camera is purchased, the monitor is stowed in the camera body. Bring out the monitor as shown below.



❶ Open the monitor. (Maximum 180°)
❷ It can be rotated 180° forward.
❸ Return the monitor to its original position.

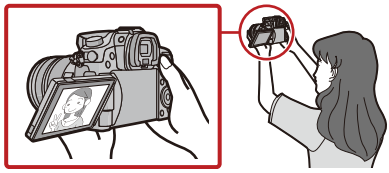
• Only rotate the monitor after opening it wide enough, and be careful not to use excessive force as it may be damaged.

■ Free angle shooting

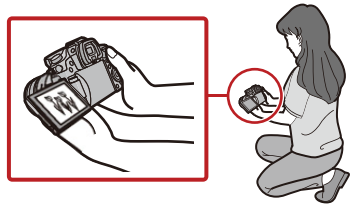
The monitor can be rotated to suit your needs. This is convenient as it allows you to take pictures from various angles by adjusting the monitor.

• Do not cover the AF Assist Lamp with your fingers or other objects.

Taking pictures at a high angle



Taking pictures at a low angle



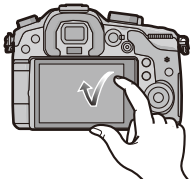
• When not using the monitor it is recommended that you close it with the screen facing inward to prevent dirt and scratches.

Touch screen

Touch panel of this unit is capacitive. Touch the panel directly with your bare finger.

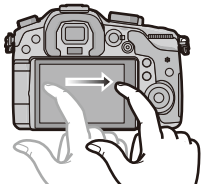
■ Touch

To touch and release the touch screen.
Use for selecting items or icons.
• When selecting features using the touch screen, be sure to touch the center of the desired icon.



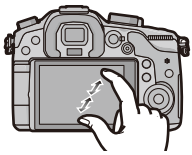
■ Drag

A movement without releasing the touch screen.
This is used to move the AF area, operate the slide bar, etc.
This can also be used to move to the next image during playback, etc.



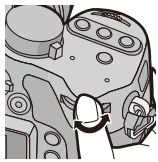
■ Pinch (enlarge/reduce)

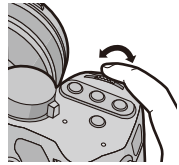
Pinch the touch panel apart (enlarge) or together (reduce) with two fingers.
Use to enlarge/reduce the played back images or AF area.



- Touch the panel with the clean and dry finger.
- The touch panel may not function normally in the following cases.
 - When touched by a gloved hand
 - When touched by a wet hand (water or hand cream, etc.)
 - When you use a commercially available monitor protect sheet
 - When touched by multiple hands or fingers at the same time
- Commercially available stylus pen is unavailable.
- If you use a commercially available monitor protection sheet, please follow the instructions that accompany the sheet. (Some monitor protection sheets may impair visibility or operability.)
- Do not press on the monitor with hard pointed tips, such as ball point pens.
- Do not operate with your fingernails.
- Wipe the monitor with dry soft cloth when it gets dirty with finger prints and others.
- Do not scratch or press the monitor too hard.
- For information about the icons displayed on the touch screen, refer to “Monitor Display/ Viewfinder Display” on P270.

Rear Dial/Front Dial





Allows you to set the aperture, shutter speed, and other settings when in **P** / **A** / **S** / **M** modes.

Mode dial	Rear Dial	Front dial
P (P85)	Program Shift	Program Shift
A (P87)	Aperture value	Aperture value
S (P88)	Shutter speed	Shutter speed
M (P89)	Shutter speed	Aperture value

• In [Dial Set.] (P60) in the [Custom] menu, you can change the operation methods of the front dial and rear dial.

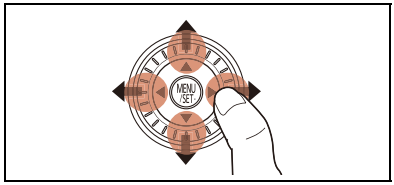
Allows you to adjust each function setting after either button [WB], [ISO] or [] is pressed.

Press	Rear Dial	Front dial
WB (P136)	White Balance selection	White Balance selection
ISO (P134)	ISO sensitivity selection	ISO sensitivity max limit setting
(P133)	Exposure Compensation	Flash brightness adjustment

Cursor buttons/[MENU/SET] button

Pressing the cursor button:
Selection of items or setting of values etc., is performed.
Pressing [MENU/SET]:
Confirmation of setting contents, etc., is performed.

• This document expresses the up, down, left, and right of the cursor button as ▲/▼/◀/▶.

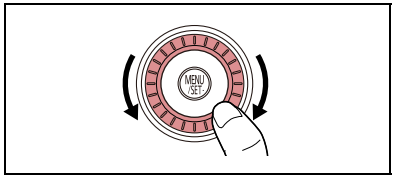


Even when the camera is operated using the touch screen, it is possible to operate with the cursor button and [MENU/SET] button if a guide like the one shown on the right is displayed.
Even on menu screens etc. on which the guide is not displayed, you can make settings and selections by operating the buttons.



Control Dial

Rotating the control dial:
Selection of items or setting of values etc., is performed.



About the Lens

Micro Four Thirds™ mount specification lens

This unit can use the dedicated lenses compatible with the Micro Four Thirds System lens mount specification (Micro Four Thirds mount).

Four Thirds™ mount specification lens

Lens with the Four Thirds mount specification can be used by using the mount adaptor (DMW-MA1: optional).

Leica mount specification lens

- When you use the M mount adaptor or R mount adaptor (DMW-MA2M, DMW-MA3R: optional), you can use Leica M Mount or Leica R Mount interchangeable lenses.
 - For certain lenses, the actual distance at which the subject is in focus may differ slightly from the rated distance.
 - When using a Leica lens mount adaptor, set [Shoot w/o Lens] (P63) to [ON].

About the lens and functions

There are functions that cannot be used, or the operation may be different depending on the lens used.

Auto Focus*/Auto aperture setting*/[Eye Sensor AF] (P67)/Defocus control function (P112)/[Stabilizer] (P117)/Touch zoom (P122)/[Shading Comp.] (P170)/[Quick AF] (P54)/[Power Zoom Lens] (P61)

* The interchangeable lens (H-HS12035 or H-VS014140) is compatible with the Auto Focus and automatic Aperture operation during the recording of motion pictures. You can record motion pictures smoother and quieter with the interchangeable lens (H-VS014140), which is designed to upgrade the AF tracking performance and reduce the operation sound.

For details on the lens used, refer to the website.

Refer to catalogs/Web pages for most current information regarding compatible lenses.
http://panasonic.jp/support/global/cs/dsc/ (This Site is English only.)

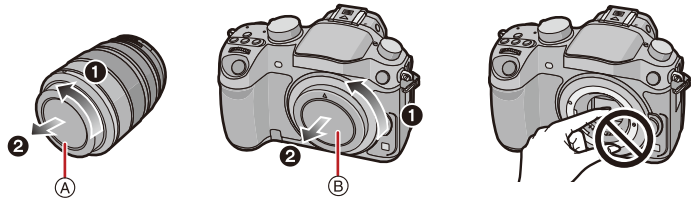
- The available flash range etc. differs depending on the aperture value of the lens you are using.
- The focal length noted on the lens in use is equivalent to double when converted to the 35 mm film camera. (It will be equivalent to 100 mm lens when a 50 mm lens is used.)
 Refer to the website for details about the 3D interchangeable lens.

Changing the Lens

- Check that the camera is turned off.
- Change lenses where there is not a lot of dirt or dust. Refer to P302, P303 when dirt or dust gets on the lens.

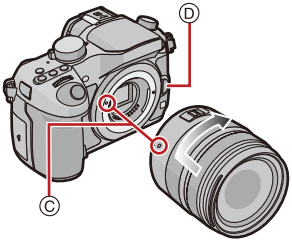
Attaching the lens

1 Turn the lens rear cap Ⓐ and the body cap Ⓑ in the direction of the arrow to detach them.



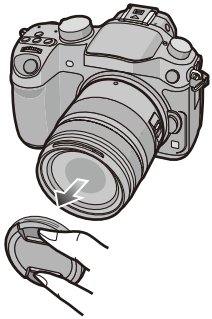
- Do not put your hands inside the mount.

2 Align the lens fitting marks Ⓒ (red marks) on the camera body and the lens and then rotate the lens in the direction of the arrow until it clicks.



- Do not press the lens release button Ⓓ when you attach a lens.
- Do not try to attach the lens when holding it at an angle to the camera body as the lens mount may get scratched.

3 Detach the lens cap.

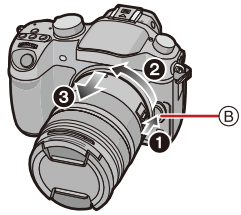


Detaching the lens

1 **Attach the lens cap.**

2 **While pressing on the lens release button Ⓑ, rotate the lens toward the arrow until it stops and then remove.**

- Always attach the body cap to the camera body so that dirt or dust does not get inside.
- Attach the lens rear cap so that the lens contact point does not get scratched.



- It is recommended to attach the lens cap or attach the MC Protector (optional) to protect the lens surface when carrying. (P269)

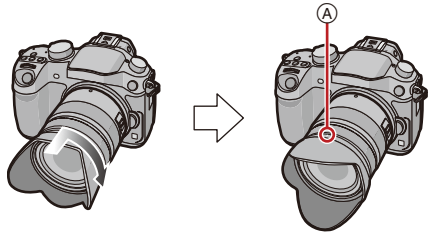
Attaching the Lens Hood

When recording into strong backlight, irregular reflection may occur within the lens. The lens hood reduces the inclusion of unwanted light in the recorded images and lowers the drop in contrast. The lens hood cuts off excess lighting and improves the picture quality.

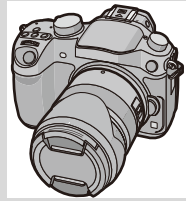
To attach the lens hood (flower shape) that came with the interchangeable lens (H-HS12035, H-VS014140)

Insert the lens hood into the lens with the short sides at the top and bottom, and turn in the direction of the arrow until it stops.

Ⓐ Fitting to the mark.



- When temporarily detaching and carrying the lens hood, attach the lens hood to the lens in the reverse direction.
- Hold the short sides of the flower shaped lens hood when attaching or detaching it.

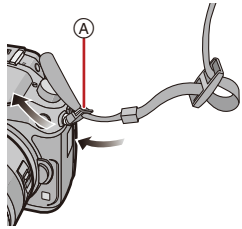


Attaching the Shoulder Strap

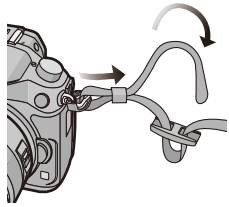
• We recommend attaching the shoulder strap when using the camera to prevent it from dropping.

1 **Pass the shoulder strap through the shoulder strap eyelet on the camera body.**

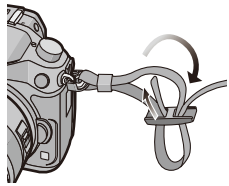
Ⓐ: Shoulder strap eyelet



2 **Pass the end of the shoulder strap through the ring in the direction of the arrow and then pass it through the stopper.**

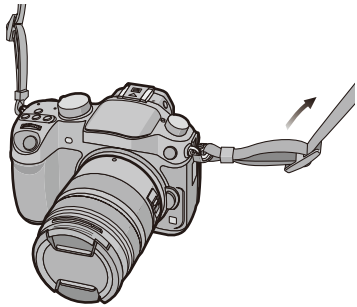


3 **Pass the end of the shoulder strap through the hole on the other side of the stopper.**



4 **Pull the other side of the shoulder strap and then check that it will not come out.**

• Perform steps **1** to **4** and then attach the other side of the shoulder strap.



- Use the shoulder strap around your shoulder.
 – Do not wrap the strap around your neck.
 – It may result in injury or accident.
- Do not leave the shoulder strap where an infant can reach it.
 – It may result in an accident by mistakenly wrapping around the neck.

Charging the Battery

About batteries that you can use with this unit

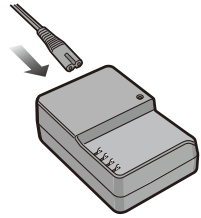
It has been found that counterfeit battery packs which look very similar to the genuine product are made available for purchase in some markets. Some of these battery packs are not adequately protected with internal protection to meet the requirements of appropriate safety standards. There is a possibility that these battery packs may lead to fire or explosion. Please be advised that we are not liable for any accident or failure occurring as a result of use of a counterfeit battery pack. To ensure that safe products are used, we recommend that a genuine Panasonic battery pack is used.

- **Use the dedicated charger and battery.**

Charging

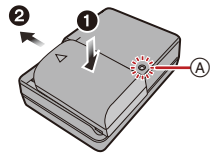
- **The battery is not charged when the camera is shipped. Charge the battery before use.**
- Charge the battery with the charger indoors.

1 **Connect the AC mains lead.**



2 **Attach the battery paying attention to the direction of the battery until it clicks.**

- The [CHARGE] indicator Ⓐ lights up and charging begins.



About the [CHARGE] indicator

The [CHARGE] indicator turns on:
The [CHARGE] indicator is turned on during charging.

The [CHARGE] indicator turns off:
The [CHARGE] indicator will turn off once the charging has completed without any problem. (Disconnect the charger from the electrical socket and detach the battery after charging is completed.)

- **When the [CHARGE] indicator flashes**
 - The battery temperature is too high or too low. It is recommended to charge the battery again in an ambient temperature of between 10 °C and 30 °C (50 °F and 86 °F).
 - The terminals of the charger or the battery are dirty. In this case, wipe them with a dry cloth.

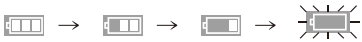
Charging time

Charging time	Approx. 220 min

- **The indicated charging time is for when the battery has been discharged completely. The charging time may vary depending on how the battery has been used. The charging time for the battery in hot/cold environments or a battery that has not been used for a long time may be longer than normal.**

Battery indication

The battery indication is displayed on the screen.



- The indication turns red and blinks if the remaining battery power is exhausted. (The status indicator also blinks) Recharge the battery or replace it with a fully charged battery.

- **Do not leave any metal items (such as clips) near the contact areas of the power plug. Otherwise, a fire and/or electric shocks may be caused by short-circuiting or the resulting heat generated.**
- The battery can be recharged even when it still has some charge left, but it is not recommended that the battery charge be frequently topped up while the battery is fully charged. (Since characteristic swelling may occur.)

Approximate operating time and number of recordable pictures

Recording still pictures (when using the Monitor/Viewfinder) (By CIPA standard in Program AE Mode)

When the interchangeable lens (H-HS12035) is used	
Number of recordable pictures	Approx. 540 pictures
Recording time	Approx. 270 min

When the interchangeable lens (H-VS014140) is used	
Number of recordable pictures	Approx. 500 pictures
Recording time	Approx. 250 min

Recording conditions by CIPA standard

- CIPA is an abbreviation of [Camera & Imaging Products Association].
- Temperature: 23 °C (73.4 °F)/Humidity: 50%RH when monitor/viewfinder is on.
- Using a Panasonic SD Memory Card (4 GB).
- Using the supplied battery.
- Starting recording 30 seconds after the camera is turned on.
 (When attaching an interchangeable lens compatible with the Optical Image Stabilizer function, set the Optical Image Stabilizer to [((✋))])
- **Recording once every 30 seconds** using full flash every second recording.
- Turning the camera off every 10 recordings and leaving it until the temperature of the battery decreases.

The number of recordable pictures varies depending on the recording interval time. If the recording interval time becomes longer, the number of recordable pictures decreases. [For example, if you were to take one picture every two minutes, then the number of pictures would be reduced to approximately one-quarter of the number of pictures given above (based upon one picture taken every 30 seconds).]

■ Recording motion pictures (when using the monitor)

– [AVCHD] (Recording with picture quality set to [FHD/60i])

When the interchangeable lens (H-HS12035) is used	
Recordable time	**Approx. 240 min**
Actual recordable time	**Approx. 120 min**

When the interchangeable lens (H-VS014140) is used	
Recordable time	**Approx. 220 min**
Actual recordable time	**Approx. 110 min**

– [MP4] (Recording with picture quality set to [FHD/30p])

When the interchangeable lens (H-HS12035) is used	
Recordable time	**Approx. 240 min**
Actual recordable time	**Approx. 120 min**

When the interchangeable lens (H-VS014140) is used	
Recordable time	**Approx. 220 min**
Actual recordable time	**Approx. 110 min**

– [MOV] (Recording with picture quality set to [FHD/60p])

When the interchangeable lens (H-HS12035) is used	
Recordable time	**Approx. 220 min**
Actual recordable time	**Approx. 110 min**

When the interchangeable lens (H-VS014140) is used	
Recordable time	**Approx. 200 min**
Actual recordable time	**Approx. 100 min**

- These times are for an ambient temperature of 23 °C (73.4 °F) and a humidity of 50%RH. Please be aware that these times are approximate.
- Actual recordable time is the time available for recording when repeating actions such as turning this unit on and off, starting/stopping recording, etc.
- Maximum time to record motion pictures continuously with [MP4] is 29 minutes 59 seconds or up to 4 GB.
- Though a [MOV] motion picture can be recorded continuously without a pause even when its file size exceeds 4 GB, the recorded content is played back with multiple files.

■ Playback (when using the monitor)

When the interchangeable lens (H-HS12035) is used	
Playback time	**Approx. 460 min**

When the interchangeable lens (H-VS014140) is used	
Playback time	**Approx. 370 min**

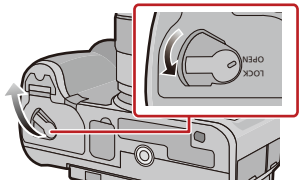
- **The operating times and number of recordable pictures will differ according to the environment and the operating conditions.**
 For example, in the following cases, the operating times shorten and the number of recordable pictures is reduced.
 – In low-temperature environments, such as on ski slopes
 – When flash is used repeatedly
- When the operating time of the camera becomes extremely short even after properly charging the battery, the life of the battery may have expired. Buy a new battery.

Inserting/Removing the Battery

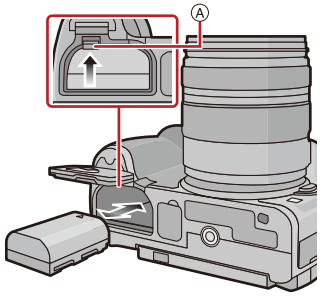
• Check that this unit is turned off.

1 **Slide the release lever in the direction of the arrow and open the battery door.**

- **Always use genuine Panasonic batteries.**
- **If you use other batteries, we cannot guarantee the quality of this product.**

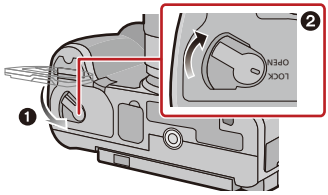


2 **Being careful about the battery orientation, insert all the way until you hear a locking sound and then check that it is locked by lever Ⓐ. Pull the lever Ⓐ in the direction of the arrow to remove the battery.**



3 **❶: Close the battery door.**

❷: Slide the release lever in the direction of the arrow.

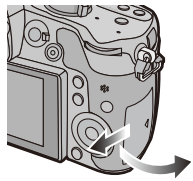


- Confirm that there is no foreign matter adhered on the inner side (rubber seal) of the battery door.
- Remove the battery after use. (The battery will be exhausted if left for a long period of time after being charged.)
- The battery becomes warm after using it and during and after charging. The camera also becomes warm during use. This is not a malfunction.
- Before removing the battery, turn the camera off, and wait until the status indicator has gone off completely. (Otherwise, this unit may no longer operate normally and the card itself may be damaged or the recorded pictures may be lost.)

Inserting/Removing the Card (Optional)

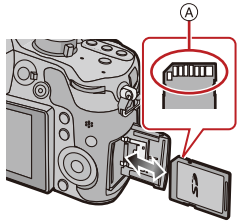
- Check that this unit is turned off.
- We recommend using a Panasonic card.

1 **Slide the card door to open it.**



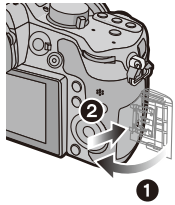
2 **Push it securely all the way until you hear a "click" while being careful about the direction in which you insert it.**
To remove the card, push the card until it clicks, then pull the card out upright.

Ⓐ: Do not touch the connection terminals of the card.



3 **❶: Close the card door.**

❷: Slide the card door to the end and then close it firmly.



- Before removing the card, turn the camera off, and wait until the status indicator has gone off completely. (Otherwise, this unit may no longer operate normally and the card itself may be damaged or the recorded pictures may be lost.)

About the Card

About cards that can be used with this unit

The following cards which conform to the SD video standard can be used with this unit. (These cards are indicated as **card** in the text.)

	Remarks
SD Memory Card (8 MB to 2 GB)	• SDXC Memory Card can only be used with SDXC Memory Card compatible equipment. • Check that the PC and other equipment are compatible when using the SDXC Memory Cards. **http://panasonic.net/avc/sdcard/information/SDXC.html** • This unit is compatible with UHS-I standard SDHC/SDXC memory cards. • Only the cards with capacity listed left can be used.
SDHC Memory Card (4 GB to 32 GB)	
SDXC Memory Card (48 GB, 64 GB)	

■ About the motion picture recording and SD speed class

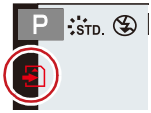
Confirm the SD Speed Class (the speed standard regarding continuous writing) on a card label etc. when you record a motion picture. Use a card with SD Speed Class with “Class 4” or more for [AVCHD]/[MP4] motion picture recording, and use “Class 10” for [MOV].

e.g.:

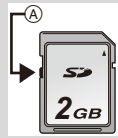


• Please confirm the latest information on the following website.
http://panasonic.jp/support/global/cs/dsc/
(This Site is English only.)

Access to the card
The access indication displays red when pictures are being recorded on the card.



- **During access (image writing, reading and deleting, formatting etc.), do not turn this unit off, remove the battery, card or disconnect the AC adaptor (optional). Furthermore, do not subject the camera to vibration, impact or static electricity.**
 The card or the data on the card may be damaged, and this unit may no longer operate normally.
 If operation fails due to vibration, impact or static electricity, perform the operation again.



- Write-Protect switch Ⓐ provided (When this switch is set to the [LOCK] position, no further data writing, deletion or formatting is possible. The ability to write, delete and format data is restored when the switch is returned to its original position.)
- The data on the card may be damaged or lost due to electromagnetic waves, static electricity or breakdown of the camera or the card. We recommend storing important data on a PC etc.
- Do not format the card on your PC or other equipment. Format it on the camera only to ensure proper operation. (P52)
- Keep the Memory Card out of reach of children to prevent swallowing.

Formatting the card (initialisation)

Format the card before recording a picture with this unit. (P52)
Since data cannot be recovered after formatting, make sure to back up necessary data in advance.

Select [Format] in the [Setup] menu. (P37)
- Confirmation screen is displayed. It is executed when [Yes] is selected.

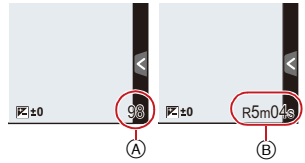
Approximate number of recordable pictures and available recording time

About the display of the number of recordable pictures and available recording time

• Switching between the display of number of recordable pictures and available recording time can be performed in the [Remaining Disp.] (P59) in the [Custom] menu.

Ⓐ Number of recordable pictures

Ⓑ Available recording time



Number of recordable pictures

• [9999+] is displayed if there are more than 10000 pictures remaining.

• Aspect ratio [4:3], Quality [▲]

[Picture Size]	2 GB	8 GB	32 GB	64 GB
L (16M)	220	900	3670	7160
M (8M)	410	1650	6690	13000
S (4M)	680	2750	11130	21490

• Aspect ratio [4:3], Quality [RAW▲]

[Picture Size]	2 GB	8 GB	32 GB	64 GB
L (16M)	69	270	1120	2220
M (8M)	81	320	1310	2580
S (4M)	88	350	1420	2800

■ Available recording time (when recording motion pictures)

• “h” is an abbreviation for hour, “m” for minute and “s” for second.

• [AVCHD]

[Rec Quality]	2 GB	8 GB	32 GB	64 GB
[FHD/60p]	8m00s	36m00s	2h31m	5h6m
[FHD/60i]	13m00s	1h00m	4h8m	8h25m
[FHD/30p]/ [FHD/24p]	9m00s	42m00s	2h56m	5h58m

• [MP4]

[Rec Quality]	2 GB	8 GB	32 GB	64 GB
[FHD/30p]	11m00s	48m00s	3h21m	6h49m
[HD/30p]	21m00s	1h33m	6h25m	13h2m
[VGA/30p]	46m00s	3h25m	14h8m	28h42m

• [MOV]

[Rec Quality]	2 GB	8 GB	32 GB	64 GB
[FHD/60p]	4m00s	20m00s	1h24m	2h51m
[FHD/30p/]	3m00s	14m00s	58m00s	1h59m
[FHD/30p]	4m00s	20m00s	1h24m	2h51m
[FHD/24p/]	3m00s	14m00s	58m00s	1h59m
[FHD/24p]	4m00s	20m00s	1h24m	2h51m
[HD/60p/]	3m00s	14m00s	58m00s	1h59m

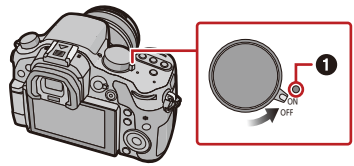
- The number of recordable pictures and the available recording time are an approximation. (These vary depending on the recording conditions and the type of card.)
- The number of recordable pictures and the available recording time varies depending on the subjects.
- Maximum time to record motion pictures continuously with [MP4] is 29 minutes 59 seconds or up to 4 GB.
- Though a [MOV] motion picture can be recorded continuously without a pause even when its file size exceeds 4 GB, the recorded content is played back with multiple files.
- The maximum available continuous recording time is displayed on the screen.

Setting Date/Time (Clock Set)

• The clock is not set when the camera is shipped.

1 Turn the camera on.

- The status indicator ❶ lights when you turn this unit on.
- If the language select screen is not displayed, proceed to step 4.



2 Touch [Language Set].

3 Select the language.



4 Press [MENU/SET].

5 Press ◄/► to select the items (year, month, day, hour, minute), and press ▲/▼ to set.

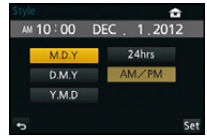
Ⓐ: Time at the home area
Ⓑ: Time at the travel destination

- You can cancel without setting the clock by pressing [🗑/↩].



To set the display order and the time display format.

- To display the setting screen of the order/time, select [Style] and then press [MENU/SET].



6 Press [MENU/SET] to set.

7 Press [MENU/SET].

Changing the Clock Setting

Select [Clock Set] in the [Setup] menu. **(P37)**

- The clock can be reset as shown in steps **5** and **6**.
- **The clock setting is maintained for 3 months using the built-in clock battery even without the battery. (Leave the charged battery in the unit for 24 hours to charge the built-in battery.)**

- If the clock is not set, the correct date cannot be printed when you stamp the date on the pictures with [Text Stamp] or order a photo studio to print the pictures.
- If the clock is set, the correct date can be printed even if the date is not displayed on the screen of the camera.

Setting the Menu

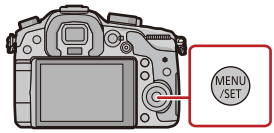
This camera offers menu selections that allow you to customize its operation to maximize your picture taking experience.
In particular, the [Setup] menu contains some important settings relating to the camera's clock and power. Check the settings of this menu before proceeding to use the camera.

Setting menu items

- If you set [Menu Resume] (P51) in the [Setup] menu to [ON], the screen shows the last selected menu item when the camera was turned off.
 It is set to [ON] at the time of purchase.
- When [Menu Information] (P51) in the [Setup] menu is set to [ON], explanations of the menu items and settings are displayed on the menu screen.
- The menu can also be set by touching the screen.

Example: In the [Rec] menu, change [Quality] from [▪▪▪] to [▪▪]

1 **Press [MENU/SET].**



Menu	Description of settings
[Rec] (P158 to 176)	This menu lets you set the aspect ratio, number of pixels and other aspects of the pictures you are recording.
[Motion Picture] (P188 to 191)	This menu lets you set the [Rec Mode], [Rec Quality], and other aspects for motion picture recording.
[Custom] (P53 to 63)	Operation of the unit, such as displaying of the screen and button operations, can be set up according to your preferences. Also, it is possible to register the modified settings.
[Setup] (P45 to 52)	This menu lets you perform the clock settings, select the operating beep tone settings and set other settings which make it easier for you to operate the camera. You can also configure the settings of Wi-Fi related functions.
[Playback] (P192 to 206)	This menu lets you set the Protection, Cropping or Print Settings, etc. of recorded pictures.

2 Press ▲/▼ of the cursor button to select the menu item and press ►.



- You can also select the menu item by rotating the rear dial or control dial.
- You can also move to the next screen by pressing [DISP.].

3 Press ▲/▼ of the cursor button to select the setting and press [MENU/SET].



- You can also select the setting by rotating the rear dial or control dial.
- Depending on the menu item, its setting may not appear or it may be displayed in a different ways.

• There are functions that cannot be set or used depending on the modes or menu settings being used on the camera due to the specifications.

■ Close the menu

Press [🗑/↩] or press the shutter button halfway.

■ Switching to other menus

e.g.: Switching to the [Setup] menu from [Rec] menu.

1 **Press ◄.**

2 **Press ▲/▼ to select [🔧] or another of the menu toggle icons Ⓐ.**

- You can also select the menu toggle icons by rotating the front dial.

3 **Press ►.**

- Select a menu item next and set it.

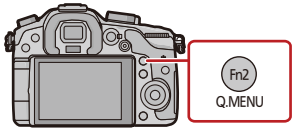


Calling frequently-used menus instantly (Quick Menu)

By using the Quick Menu, some of the menu settings can be easily found.
- The features that can be adjusted using Quick Menu are determined by the mode or a display style the camera is in.

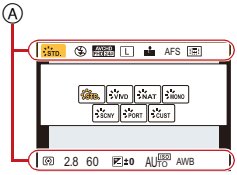
[Q.MENU]/[Fn2] button can be used in two ways, as [Q.MENU] or as [Fn2] (function 2). At the time of purchase, it is initially set to [Q.MENU].
- Refer to P42 for details about the function button.

1 **Press [Q.MENU] to display the Quick Menu.**



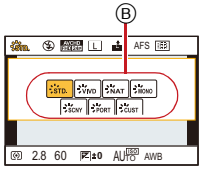
2 **Rotate the front dial to select the menu item.**

Ⓐ Item
- Setting can also be performed by rotating the control dial.



3 **Rotate the rear dial to select the setting.**

Ⓑ Settings

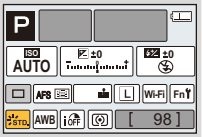


4 **Press [Q.MENU] to exit the menu once the setting is complete.**

- You can close the menu by pressing the shutter button halfway.

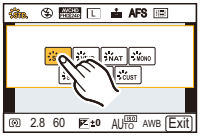
• You can also set items by pressing the cursor buttons ▲/▼/◄/►.

On-monitor recording information in [] (Monitor style)
(P72)
Select the item by pressing the [Q.MENU] button and rotating the control dial, and then select the setting by rotating the front /rear dial.
• You can also set with ▲/▼/◄/► and [MENU/SET].



■ **When operating the touch screen**

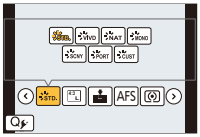
1 **Press [Q.MENU] to display the Quick Menu.**
2 **Touch the menu item.**
3 **Touch the setting.**
4 **Touch [Exit] to exit menu once the setting is completed.**
• You can close the menu by pressing the shutter button halfway.



Change the Quick Menu to your preferred item

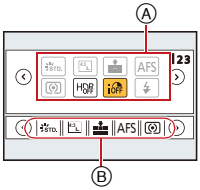
When [Q.MENU] (P59) in the [Custom] menu is set to [CUSTOM], the Quick Menu can be changed as desired. Up to 15 items can be set to the Quick Menu.

1 **Press ▼ to select [Q] and then press [MENU/SET].**



2 **Press ◄/► to select the menu item in the top row and then press [MENU/SET].**

3 **Press ◄/► to select the empty space in the bottom row and then press [MENU/SET].**



Ⓐ Items that can be setup as Quick Menus.
Ⓑ Items that can be displayed in the Quick Menu screen.

- You can also set the menu item by dragging it from the top row to the bottom row.
- If there is no empty space in the bottom row, you can replace an existing item with a new select item by selecting the existing item.
- To cancel the setting, move to the bottom row by pressing ▼ and select an item to cancel, and then press [MENU/SET].
- Items that can be set are as follows:

[Rec] menu/Recording functions	
• [Photo Style] (P158) • [Aspect Ratio] (P160)/[Picture Size] (P160) • [Quality] (P161) • [Metering Mode] (P162) • [HDR] (P164) • [i.Dynamic] (P163) • [Flash Mode] (P125) • [i.Resolution] (P163)	• [Ex. Tele Conv.] (still pictures/motion pictures) (P119) • [Digital Zoom] (P119) • [Electronic Shutter] (P167) • [Burst Rate] (P153) • [Auto Bracket] (P155) • [Self Timer] (P157) • [Stabilizer] (P117)

[Motion Picture] menu
• [Rec Mode]/[Rec Quality] (P177) • [Picture Mode] (P183) • [Time Code] (P189)

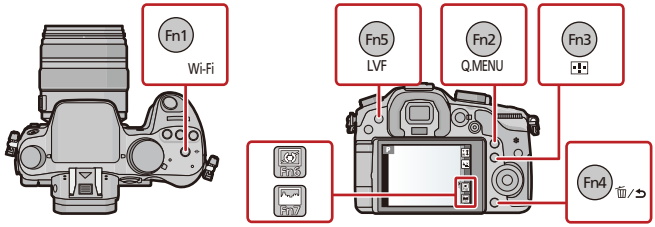
[Custom] menu
• [AFS/AFF] (P54) • [Histogram] (P57) • [Guide Line] (P57) • [Step Zoom] (P61) • [Zoom Speed] (P61) • [Rec Area] (P59)

4 **Press [🗑/↩].**

- It will return to screen of above step *1*. Press [MENU/SET] to switch to the recording screen.

Assigning frequently used functions to the buttons (function buttons)

You can assign recording functions, etc. to specific buttons and icons.
To use those functions, press [Fn1], [Fn2], [Fn3], [Fn4] or [Fn5] or touch [Fn6] or [Fn7].



1 **Select the function buttons you want to assign the function from the [Fn Button Set] in the [Custom] menu.** **(P37)**

2 Press ▲/▼ to select the function you want to assign and then press [MENU/SET].

• Assign your favorite functions to each of the function buttons.

[Rec] menu/Recording functions	
• [Wi-Fi] (P207): [Fn1]*	• [Picture Size] (P160)
• [Q.MENU] (P39): [Fn2]*	• [Quality] (P161)
• [AF Mode] (P141): [Fn3]*	• [Metering Mode] (P162)
• [LVF/Monitor Switch] (P66): [Fn5]*	• [Burst Rate] (P153)
• [AF/AE LOCK] (P151)	• [Auto Bracket] (P155)
• [Preview] (P91): [Fn4]*	• [Self Timer] (P157)
• [One Push AE]	• [i.Dynamic] (P163)
• [Level Gauge] (P74): [Fn6]*	• [i.Resolution] (P163)
• [Focus Area Set]	• [HDR] (P164)
• [Zoom Control] (P120)	• [Electronic Shutter] (P167)
• [1 Shot RAW+JPG]	• [Flash Mode] (P125)
• [1 Shot Spot Metering]	• [Ex. Tele Conv.] (still pictures/motion pictures) (P119)
• [Cursor Button Lock]	• [Digital Zoom] (P119)
• [Photo Style] (P158)	• [Stabilizer] (P117)
• [Aspect Ratio] (P160)	• [Restore to Default]
[Motion Picture] menu	
• [Motion Pic. Set] (P177)	• [Picture Mode] (P183)
	• [Time Code Display] (P189)
[Custom] menu	
• [AFS/AFF] (P54)	• [Step Zoom] (P61)
• [Histogram] (P57): [Fn7]*	• [Zoom Speed] (P61)
• [Guide Line] (P57)	• [Rec Area] (P59)

*Function button settings at the time of purchase.

• Exit the menu after it is set.

- Some functions cannot be used depending on the mode or displayed screen.
- When [One Push AE] is assigned, the Exposure meter is displayed. The aperture and the shutter speed are adjusted automatically to suitable levels when the Exposure setting is too dark or too bright.
 In the following cases, suitable exposure cannot be set. (Exposure meter is displayed)
 – When the subject is extremely dark and it is not possible to achieve adequate exposure by changing the aperture value or shutter speed
 – When recording using the flash
 – In Preview Mode (P91)
 – When using a lens that includes an aperture ring
- When set to [Focus Area Set], it is possible to display the position setting screen of either AF area or MF Assist.
- When [1 Shot RAW+JPG] is set, it will record the RAW file and a fine JPEG image simultaneously once only. It will return to original quality after recording.
- When [1 Shot Spot Metering] is set, it will record with [Metering Mode] set to [⊙] (spot) once only. It will return to original Metering Mode after recording.
- Operations of the cursor button, [MENU/SET], and the control dial are disabled when [Cursor Button Lock] is set. Press the function button again to enable them.
- When [Restore to Default] is set, function button settings return to the default configuration.
- [Fn1] cannot be used during Time Lapse Shooting.
- [Fn4] cannot be used in Intelligent Auto (iA or iA+) Mode and Creative Control Mode.
- [Fn6] and [Fn7] cannot be used when the viewfinder is in use.

■ Configuring the function button settings from the on-monitor recording information screen

Touching [Fn] on the on-monitor recording information screen (P72) also allows you to display the screen in step **1**.

■ Using function buttons with touch operations

[Fn6] and [Fn7] are used by touching function buttons.

❶ Touch [◁].



❷ Touch [Fn6] or [Fn7].
- The assigned function will operate.



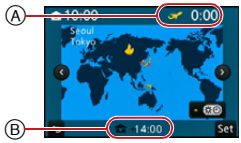
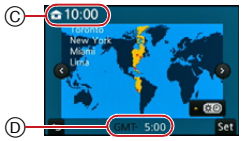
Configuring basic settings of this unit (Setup Menu)

For details on how to select the [Setup] menu settings, refer to P37.

[Clock Set] and [Economy] are important items. Check their settings before using them.

[Clock Set]	—

• Refer to P35 for details.

[World Time]	Set the time in your home area and travel destination. You can display the local times at the travel destinations and record them on the pictures you take. • Set [Home] first thing after purchasing. [Destination] can be set after setting up [Home]. **After selecting [Destination] or [Home], press ◄/► to select an area, and press [MENU/SET] to set.** **[Destination]:** Travel destination area Ⓐ Current time of the destination area Ⓑ Time difference from home area  **[Home]:** Your home area Ⓒ Current time Ⓓ Time difference from GMT (Greenwich Mean Time) 

• Press ▲ if you are using Summer Time [▲☀]. (The time will move forward by 1 hour.) Press ▲ once more to return to the normal time.
• If you cannot find the travel destination in the areas displayed on the screen, set by the time difference from the home area.

[Travel Date]	Departure date and return date of the trip as well as the name of the travel destination can be set. You can display the number of days that have passed when playing back the pictures and stamp it on the recorded pictures with [Text Stamp] (P197). **[Travel Setup]:** **[SET]:** Departure date and return date are set. Elapsed days (how many days after) of the trip are recorded. **[OFF]** • The travel date is automatically canceled if the current date is after the return date. If the [Travel Setup] is set to [OFF], [Location] will also be set to [OFF]. **[Location]:** **[SET]:** Travel destination is recorded at the time of recording. **[OFF]** • For details on how to enter characters, refer to "Entering Text" on P64. • A maximum of 30 characters can be entered. • Up to 15 characters can be entered for [＼], [「], [」], [•] and [—].

- The number of days that have passed since the departure date can be printed out using the "PHOTOfunSTUDIO" bundled software on the CD-ROM (supplied).
- The travel date is calculated using the date in the clock setting and the departure date you set. If you set [World Time] to the travel destination, the travel date is calculated using the date in the clock setting and the travel destination setting.
- The travel date setting is memorized even if the camera is turned off.
- The [Travel Date] feature is disabled when recording [AVCHD] motion pictures.
- While recording motion pictures, the [Location] feature is disabled.

[Wi-Fi]	**[Wi-Fi Function]/[Wi-Fi Setup]**

- Refer to P210, 244 for details.

[Beep]	Set the volume for electronic noises and the electronic shutter noise.	
	[Beep Volume]:	**[E-Shutter Vol]:**
	[]] (High)	**[] (High)**
	[]] (Low)	**[] (Low)**
	[]] (OFF)	**[] (OFF)**

- The [E-Shutter Vol] only works when [SH] for Burst Mode or [Electronic Shutter] is set to [ON].

[Speaker Volume]	Adjust the volume of the speaker to any of the 7 levels.

• When you connect the camera to a TV, the volume of the TV speakers does not change.

[Headphone Volume]	Adjust the volume of when connected headphone (optional) from 16 levels.

[Monitor Display]/ [Viewfinder]	Brightness, color, or red or blue tint of the Monitor/viewfinder is adjusted.
	[☼] ([Brightness]): Adjust the brightness. **[◑] ([Contrast · Saturation]):** Adjust the contrast or clarity of colors. **[▲] ([Red Tint]):** Adjust the red tint. **[▲] ([Blue Tint]):** Adjust the blue tint.
	1 **Select the settings by pressing ▲/▼, and adjust with ◄/►.** • Adjusting can also be performed by rotating the control dial. ***2*** **Press [MENU/SET] to set.**

• It will adjust the monitor when the monitor is in use, and the viewfinder when the viewfinder is in use.
• Some subjects may appear differently from actuality on the monitor. However, this does not affect the recorded pictures.

[Monitor Luminance]	Sets the monitor brightness according to the ambient light level.
	[AUTO]: The brightness is adjusted automatically depending on how bright it is around the camera. **[MODE1]:** Make the monitor brighter. **[MODE2]:** Make the monitor darker.

• The brightness of pictures displayed on the monitor is enhanced, so some subjects on the monitor may appear different from the actual subjects. However, this enhancement does not affect recorded pictures.
• [AUTO] is only available in the Recording Mode.
• The initial setting when using the AC adaptor (optional) is [MODE1].

[Economy]	You can conserve the battery life by setting these menus. Also, it will turn off the monitor/viewfinder automatically when not in use to prevent discharge of the battery.
	[Sleep Mode]: The camera is automatically turned off if the camera has not been used for the time selected on the setting. **[10MIN.]/[5MIN.]/[2MIN.]/[1MIN.]/[OFF]**
	[Auto LVF/Monitor Off]: The monitor/viewfinder is automatically turned off if the camera has not been used for the time selected on the setting. **[5MIN.]/[2MIN.]/[1MIN.]**

- Press the shutter button halfway or turn the camera off and on to cancel [Sleep Mode].
- To turn the monitor/viewfinder on again, press any button or touch the monitor.
- When the eye sensor automatic switching (P54) is activated, [Auto LVF/Monitor Off] is canceled.
- [Economy] does not work in the following cases.
 – When connecting to a PC or a printer
 – When recording or playing back motion pictures
 – During a slide show
 – [Multi Exp.]
- When using the AC adaptor (optional), [Sleep Mode] is disabled.

[Battery Use Priority]	**[BODY]/[BG]**

- Refer to P268 for details.

[USB Mode]	Select the USB communication system after or before connecting the camera to your PC or your printer with the USB connection cable (supplied).
	[Select on connection]: Select either [PC] or [PictBridge(PTP)] if you connected the camera to a PC or a printer supporting PictBridge. **[PictBridge(PTP)]:** Set after or before connecting to a printer supporting PictBridge. **[PC]:** Set after or before connecting to a PC.

[Output]	This sets how the unit connects to a television etc. **[TV Aspect]:** Set to match the type of TV. 16:9 **[16:9]:** When connecting to a 16:9 screen TV. 4:3 **[4:3]:** When connecting to a 4:3 screen TV. • This will work when the AV cable (optional) is connected. **[HDMI Mode]:** Set the format for the HDMI output when playing back on the HDMI compatible high-definition TV connected with this unit using the HDMI mini cable (optional). **[AUTO]:** The output resolution is automatically set based on the information from the connected TV. **[1080p]:** The progressive method with 1080 available scan lines is used for output. **[1080i]:** The interlace method with 1080 available scan lines is used for output. **[720p]:** The progressive method with 720 available scan lines is used for output. **[480p]:** The progressive method with 480 available scan lines is used for output.

[Output] (continued)	• This will work when the HDMI mini cable (optional) is connected. • If the images are not output on the TV when the setting is [AUTO], match with the image format your TV can display, and select the number of effective scanning lines. (Please read the operating instructions for the TV.)
	[HDMI Info Display (Rec)]: Set whether to show the information when you monitor this unit's motion picture recording on TV, etc. **[ON]/[OFF]** • This will work when the HDMI mini cable (optional) is connected. • Refer to P182 for details.

[VIERA Link]	Settings that allow this unit to be controlled by the remote control of the VIERA equipment by automatically coupling this unit with the VIERA Link compatible equipment using HDMI mini cable (optional).	
	[ON]:	Remote control operation of the VIERA Link compatible equipment is enabled. (Not all operations are possible) Button operation of the main unit will be limited.
	[OFF]:	Operation is performed with the buttons on this unit.

• This will work when the HDMI mini cable (optional) is connected.
• Refer to P252 for details.

[3D Playback]	Set the output method for 3D pictures.	
	[3D]:	Set when connecting to a 3D compatible television.
	[2D]:	Set when connecting to a television not compatible with 3D. Set this when you would like to view pictures in 2D (conventional image) on a 3D compatible television.

• This will work when the HDMI mini cable (optional) is connected.
• Refer to P248 for the method to play back 3D pictures in 3D.

[Menu Resume]	Stores the location of the last-used menu item for each menu.
	[ON]/[OFF]

[Menu Background]	Set the background color for the menu screen.

• You can select the background color from four colors.

[Menu Information]	Explanations of the menu items and settings are displayed on the menu screen.
	[ON]/[OFF]

[Language]	Set the language displayed on the screen.

• If you set a different language by mistake, select [⚙] from the menu icons to set the desired language.

[Version Disp.]	—

• This enables the firmware versions of the camera and lens to be checked.
• [–. –] is displayed as the lens firmware when the lens is not mounted.
• Press [MENU/SET] on the version display screen to display information about the software on the unit.

[No.Reset]	Reset the file number of the next recording to 0001.

• The folder number is updated and the file number starts from 0001.
• A folder number between 100 and 999 can be assigned.
The folder number should be reset before it reaches 999. We recommend formatting the card (P52) after saving the data on a PC or elsewhere.
• To reset the folder number to 100, format the card first and then use this function to reset the file number.
A reset screen for the folder number will then appear. Select [Yes] to reset the folder number.

[Reset]	The [Rec] or [Setup]/[Custom] menu settings are reset to the initial settings.

• When the recording setting is reset, the content of the following settings is also reset.
– The [Face Recog.] setting
– The [Profile Setup] setting
• When [Setup]/[Custom] menu settings are reset, the following settings are also reset.
– The [World Time] setting
– The settings of [Travel Date] (departure date, return date, location)
• The folder number and the clock setting are not changed.

[Reset Wi-Fi Settings]	Reset all settings in the [Wi-Fi] menu to factory default settings.*

- Always reset the camera when disposing or selling it to prevent personal information saved within the camera from being misused.
- Always reset the camera after making a copy of personal information when sending the camera in to be repaired.

* (Excluding [LUMIX CLUB]) (P242)

[Pixel Refresh]	It will perform optimisation of imaging device and image processing.

- Imaging device and image processing is optimized when the camera is purchased. Use this function when bright spots that do not exist in the subject get recorded.
- Turn the camera off and on after the pixels are corrected.

[Sensor Cleaning]	Dust reduction to blow off the debris and dust that have affixed to the front of the imaging device is performed.

- Dust Reduction Function will operate automatically when the camera is turned on, but you can use this function when you see dust. (P302)

[Format]	The card is formatted. **Formatting permanently deletes all data on your memory card. Please be sure all pictures and motion pictures are saved elsewhere before using this feature.**

- Use a battery with sufficient battery power or the AC adaptor (optional) when formatting. Do not turn the camera off during formatting.
- If the card has been formatted on a PC or other equipment, format it on the camera again.
- If the card cannot be formatted, consult Panasonic.

For USA and Puerto Rico assistance, please call:
1-800-211-PANA(7262) or, contact us via the web at:
http://www.panasonic.com/contactinfo

For Canadian assistance, please call:
1-800-99-LUMIX (1-800-995-8649) or
send e-mail to: lumixconcierge@ca.panasonic.com

Setting your preferred operation methods ([Custom] Menu)

For details on how to select the [Custom] menu settings, refer to P37.

[Cust.Set Mem.]	[C1]/[C2]/[C3-1]/[C3-2]/[C3-3]

• Refer to P115 for details.

[AF/AE Lock]	[AE LOCK]/[AF LOCK]/[AF/AE LOCK]/[AF-ON]

• Refer to P151 for details.

[AF/AE Lock Hold]	This will set the operation of [AF/AE LOCK] button when taking a picture with fixed focus or exposure.	
	[ON]:	The focus and the exposure remain fixed even if you release [AF/AE LOCK] after pressing it. If you press [AF/AE LOCK] again, AF/AE Lock is canceled.
	[OFF]:	The focus and the exposure are fixed only while you are pressing [AF/AE LOCK]. (P151) If you release [AF/AE LOCK], AF/AE Lock is canceled.

[Shutter AF]	Set whether or not the focus is adjusted automatically when the shutter button is pressed halfway.
	[ON]/[OFF]

[Half Press Release]	The shutter will immediately fire when the shutter button is pressed halfway.
	[ON]/[OFF]

[AFS/AFF]	The [AFS/AFF] of the focus mode lever (P142) can be used for either [AFS] or [AFF].
	[AFS]/[AFF]

[Quick AF]	As long as the camera is held steady, the camera will automatically adjust the focus and focus adjustment will then be quicker when the shutter is pressed. This is useful when you do not want to miss a picture-taking opportunity.
	[ON]/[OFF]

- The battery will be consumed faster than usual.
- Press the shutter button halfway again when it is difficult to focus on the subject.
- The [Quick AF] feature is disabled in the following conditions:
 – In Preview Mode
 – In low light situations
 – With lenses that only offer Manual Focus
 – With some Four Third lenses that do not support contrast AF

[Eye Sensor AF]	**[ON]/[OFF]**

- Refer to P67 for details.

[Pinpoint AF Time]	Sets the time for which the screen is enlarged when the shutter button is pressed halfway with Auto Focus Mode set to [⊞].
	[LONG] (Approx. 1.5 seconds)/[MID] (Approx. 1.0 seconds)/ [SHORT] (Approx. 0.5 seconds)

[AF Assist Lamp]	AF assist lamp will illuminate the subject when the shutter button is pressed halfway, making it easier for the camera to focus when recording in low light conditions. (Larger AF area is displayed depending on the recording conditions.)
	[ON]/[OFF]

- The effective range of the AF Assist Lamp is different depending on the lens used.
 - When the interchangeable lens (H-HS12035) is attached and at Wide: Approx. 1.0 m (3.3 feet) to 3.5 m (11.0 feet)
 - When the interchangeable lens (H-VS014140) is attached and at Wide: Approx. 1.0 m (3.3 feet) to 3.0 m (9.8 feet)
- The AF Assist Lamp is valid only for the subject in the center of the screen. Use it by positioning the subject in the center of the screen.
- Remove the lens hood.
- When you do not want to use the AF Assist Lamp (e.g. when taking pictures of animals in dark places), set the [AF Assist Lamp] to [OFF]. In this case, it will become more difficult to focus on the subject.
- The AF Assist Lamp gets slightly blocked when the interchangeable lens (H-HS12035, H-VS014140) is used, but it does not affect the performance.
- The AF Assist Lamp may be greatly blocked, and it may become harder to focus when a lens with large diameter is used.
- The setting for the [AF Assist Lamp] is fixed to [OFF] in the following cases.
 - [Distinct Scenery]/[Bright Blue Sky]/[Romantic Sunset Glow]/[Vivid Sunset Glow]/[Glistening Water]/[Clear Nightscape]/[Cool Night Sky]/[Warm Glowing Nightscape]/[Artistic Nightscape] (Scene Guide Mode)

[Direct Focus Area]	**[ON]/[OFF]**

- Refer to P147, 149 for details.

[Focus/Release Priority]	It will set so no picture can be taken when it is out of focus.	
	[FOCUS]:	You cannot take a picture until the subject is brought into focus.
	[RELEASE]:	This gives priority to the best time to take a picture so you can take a picture when the shutter button is pressed fully.

- When set to [RELEASE], please be aware that focus may not be achieved even with [Focus Mode] set to [AFS], [AFF] or [AFC].
- [Focus/Release Priority] is disabled during motion picture recording.

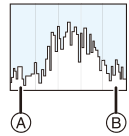
[AF+MF]	It is possible to adjust focus manually after it was adjusted automatically. **[ON]:** When AF Lock is ON (press the shutter button halfway with the [Focus Mode] set to [AFS] or set AF Lock using [AF/AE Lock]), you can make fine adjustments to the focus manually. **[OFF]**

[MF Assist]	Sets the display method of MF Assist (enlarged screen). []*: Enlarge by rotating the lens focus ring/lever, or by pressing []. []: Enlarge by rotating the lens focus ring/lever. []*: Enlarge by pressing []. **[OFF]:** MF Assist is not displayed. * Press the function button to which [AF Mode] in [Fn Button Set] (P42) has been assigned. (assigned to []/[Fn3] at the time of purchase)

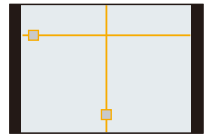
• If you enlarge an image by pressing [], the enlargement is maintained until you press [] again.

[MF Guide]	**[ON]/[OFF]**

• Refer to P148 for details.

[Histogram]	This allows you to set either to display or not display the histogram. **[ON]:** You can set the position by pressing ▲/▼/◄/►. • Direct touch operation is also possible from the recording screen.  **[OFF]** A histogram is a graph that displays brightness along the horizontal axis (black to white) and the number of pixels at each brightness level on the vertical axis. It allows you to easily check a picture's exposure. Ⓐ dark Ⓑ bright 

- **When the recorded picture and the histogram do not match each other under the following conditions, the histogram is displayed in orange.**
 - – When the Manual Exposure Assistance is other than [±0] during Exposure Compensation or in the Manual Exposure Mode
 - – When the flash is activated
 - – When suitable exposure is not achieved with the flash closed
 - – When the brightness of the screen is not correctly displayed in dark places
- The histogram is an approximation in the Recording Mode.
- The histogram displayed in this camera does not match histograms displayed by picture editing software used in PCs etc.

[Guide Line]	This will set the pattern of guide lines displayed when taking a picture. **[▦]/[▩]** **[▦]:** You can set the position by pressing ▲/▼/◄/►. • You can also set the position directly by touching [▩] on the guideline of the recording screen.  **[OFF]**

- When you align the subject on the horizontal and vertical guidelines or the cross point of these lines, you can take pictures with well-designed composition by viewing the size, the slope and the balance of the subject.

[Highlight]	When the Auto Review function is activated or when playing back, white saturated areas appear blinking in black and white. This does not affect the recorded image.
	[ON]/[OFF]

- If there are any white saturated areas, we recommend compensating the exposure towards negative (P133) referring to the histogram (P57) and then taking the picture again. It may result in a better quality picture.
- This does not work while in Multi Playback, Calendar Playback, or Playback Zoom.

[ON] **[OFF]**

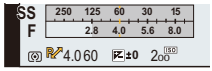


[Constant Preview]	**[OFF]/[ON]**

- Refer to P90 for details.

[Expo.Meter]	Set whether or not to display the exposure meter.
	[ON]/[OFF]

- If you set [Expo.Meter] to [ON], [Expo.Meter] is displayed when operating Program Shift, the aperture setting and the shutter speed.
- Unsuitable areas of the range are displayed in red.
- When [Expo.Meter] is not displayed, switch the display information for screen by pressing [DISP.]. (P72)
- The [Expo.Meter] disappears after approximately 4 seconds if no operation is performed.



[LVF Disp.Style]	This will set the display style of the viewfinder.
	[]: Viewfinder style
	[]: Monitor style

- Refer to P73 for details.

[Monitor Disp. Style]	This will set the display style of the monitor.
	[]: Viewfinder style
	[]: Monitor style

- Refer to P72 for details.

[Monitor Info. Disp.]	Display the recording information screen. (P72)
	[ON]/[OFF]

[Rec Area]	This changes the angle of view during motion picture recording and still picture recording.
	[📷] (Picture)/[🎥] (Motion picture)

• The recording area indicated is a guide line.

[Remaining Disp.]	This will switch display between the number of recordable pictures and available recording time.
	[📷:🖼] ([Remaining Shots]): This will display the number of recordable pictures for still pictures. **[🎥:🕘] ([Remaining Time]):** This will display the available recording time for motion pictures.

[Auto Review]	Set the length of time that the picture is displayed after taking the still picture.
	[HOLD]: The pictures are displayed until shutter button is pressed halfway. **[5SEC]/[4SEC]/[3SEC]/[2SEC]/[1SEC]/[OFF]**

• When the [Auto Review] is set to [HOLD], you can switch the display of the playback screen or enlarge the image by rotating the rear dial while the reviewing.
• [Auto Review] does not work when recording motion pictures.

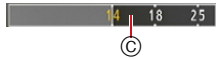
[Fn Button Set]	—

• Refer to P42 for details.

[Q.MENU]	Switch the setting method of Quick Menu.
	[PRESET]: The Quick Menu will consist of the preset items. **[CUSTOM]:** The Quick Menu will consist of desired items. (P41)

[Dial Set.]	Changes the operation methods of the front dial and rear dial. (P17)
	[Assign Dial (F/SS)]: Assigns the operations of the aperture value and shutter speed in Manual Exposure Mode. **[F SS]:** Assigns the aperture value to the front dial, and the shutter speed to the rear dial. **[SS F]:** Assigns the shutter speed to the front dial, and the aperture value to the rear dial. **[Rotation (F/SS)]:** Changes the rotation direction of the dials for adjusting the aperture value and shutter speed. **[]/[]** **[Exposure Comp.]:** Assigns the Exposure Compensation to the front dial or rear dial so that you can directly adjust it. **[] (Front Dial)/[] (Rear Dial)/[OFF]**

[Video Button]	Enables/disables the motion picture button.
	[ON]/[OFF]

[Power Zoom Lens]	This may only be selected when using a lens that is compatible with power zoom (electrically operated zoom). – The interchangeable lenses (H-HS12035, H-VS014140) are not compatible with power zoom. (For compatible lenses, please refer to our website.)
	[Disp Focal Length]: When you zoom, the focal distance is displayed and you can confirm the zoom position. Ⓐ Current focal distance Ⓑ Focal length indication **[ON]/[OFF]** 
	[Step Zoom]: When you operate the zoom with this setting [ON], the zoom will stop at positions corresponding to predetermined distances. Ⓒ Step zoom indication • [Step Zoom] is disabled during motion picture recording. **[ON]/[OFF]** 
	[Zoom Resume]: When you turn this unit on, the zoom positions when you last turned this unit off are automatically restored. **[ON]/[OFF]**
	[Zoom Speed]: You can set the zoom speed for zoom operations. • If you set [Step Zoom] to [ON], the zoom speed will not change. **[Photo]:** **[H]** (High speed), **[M]** (Middle speed), **[L]** (Low speed) **[Video]:** **[H]** (High speed), **[M]** (Middle speed), **[L]** (Low speed)
	[Zoom Ring]: This may only be selected when a power zoom-compatible lens with a zoom lever and zoom ring is attached. When set to [OFF], the operations controlled by the zoom ring are disabled to prevent accidental operation. **[ON]/[OFF]**

[Eye Sensor]	It will switch automatically to viewfinder display when an eye or object gets near the viewfinder using an eye sensor. It will return to monitor display when it goes away.
	[Sensitivity]: This will set the sensitivity of the eye sensor. **[HIGH]/[LOW]**
	[LVF/Monitor Auto]: Enables/disables the eye sensor. **[ON]/[OFF]**

• Monitor display and viewfinder display can be switched manually by pressing [LVF]. (P66)

[Touch Settings]	Enables/disables the Touch operation. When set to [OFF], no corresponding touch tab or touch icon is displayed on the screen.
	[Touch Screen]: All touch operations. When set to [OFF], only button and dial operations can be used. **[ON]/[OFF]**
	[Touch Tab]: Operation to display the touch icons by touching tabs such as [◁] displayed on the right of the screen. **[ON]/[OFF]**
	[Touch AF]: Operation to focus on the touched subject. **[ON]/[OFF]**
	[Touch Pad AF]: Using the monitor as a touch pad when the viewfinder is in use. (P67) **[EXACT]/[OFFSET]/[OFF]**

[Touch Scroll]	This allows you to set the speed of continuously forwarding or rewinding pictures using touch operation.
	[H]: High speed
	[L]: Low speed

[Menu Guide]	Set the screen that is displayed when the mode dial is set to SCN and .	
	[ON]:	Displays the selection screen for the Scene Guide or the Creative Control Mode.
	[OFF]:	Displays the recording screen of the Scene Guide or the Creative Control Mode.

[Shoot w/o Lens]	Sets whether or not the shutter can be released when no lens is attached to the main body.	
	[ON]:	Shutter will operate regardless of the lens on the unit.
	[OFF]:	You cannot press the shutter button when a lens is not attached to the camera body or is not attached correctly.

• When using a Leica lens mount adaptor (DMW-MA2M, DMW-MA3R: optional), set it to [ON].

Entering Text

It is possible to enter babies' and pets' names and the names of travel destinations when recording. (Only alphabetical characters and symbols can be entered.)

1 Display the entry screen.

- You can display the entry screen via the following operations.
 - –[Name] in [Face Recog.] (P174)
 - –[Name] of [Baby1], [Baby2] or [Pet] in [Profile Setup] (P176)
 - –[Location] in [Travel Date] (P46)
 - –[Title Edit] (P196)
 - –[LUMIX CLUB], [Device Name], [External AV device], [Wi-Fi Password], [Register to Favorite] (P215) in the [Wi-Fi Setup] (P244) menu.

2 Press ▲/▼/◀/▶ to select text and then press [MENU/SET] to register.



- Move the cursor to [A↵a] and then press [MENU/SET] to switch text between [A] (capitals), [a] (lower case), [1] (numbers) and [&] (special characters).
- To enter the same character again, rotate the control dial right to move the cursor.
- The following operations can be performed by moving the cursor to the item and pressing [MENU/SET]:
 - –[␣]: Enter a blank
 - –[Delete]: Delete a character
 - –[◀]: Move the entry position cursor to the left
 - –[▶]: Move the entry position cursor to the right

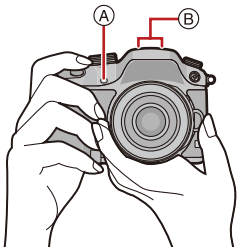
3 Press ▲/▼/◀/▶ to move the cursor to [Set] and then press [MENU/SET] to end text input.

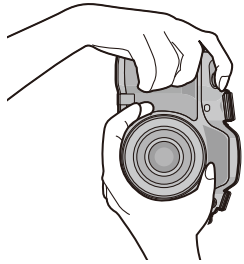
- Text can be scrolled if all of the entered text does not fit on the screen.

Tips for taking good pictures

Hold the camera gently with both hands, keep your arms still at your side and stand with your feet slightly apart.

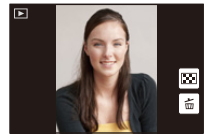
- **Do not cover the flash, the AF assist lamp Ⓐ or the microphone Ⓑ (P12) with your fingers or other objects.**
- Be careful not to move the camera when you press the shutter button.
- When taking pictures, make sure your footing is stable and there is no danger of colliding with another person, an object etc.





Detects orientation of camera (Direction Detection Function)

This function detects the vertical orientation when you record with the camera vertically orientated. When you play back the recording, the recording is automatically displayed in vertical orientation. (Only available when [Rotate Disp.] (P202) is set to [ON].)



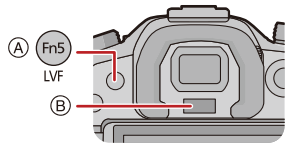
- When recording with this unit, Direction Detection can be performed even if you are using a lens that is not compatible with the Direction Detection Function.
- When the camera is held vertically and tilted significantly up or down to record, the Direction Detection Function may not work correctly.
- Motion pictures taken with the camera held vertically are not displayed vertically.
- You cannot record 3D pictures in vertical orientation.

Using the Viewfinder

Switching the Monitor/Viewfinder

About the eye sensor automatic switching

When [LVF/Monitor Auto] of [Eye Sensor] (P62) in the [Custom] menu is set to [ON] and your eye or an object is brought close to the viewfinder, the display automatically switches to the viewfinder display. Sensitivity of the eye sensor can be set to [HIGH] or [LOW] with [Sensitivity].



Ⓐ [LVF]/[Fn5] button
Ⓑ Eye sensor

- Eye sensor might not work properly depending on the shape of your eyeglasses, the way you hold the camera, or bright light shining around the eyepiece. Switch manually in that case.
- The eye sensor is disabled during motion picture playback and slide show.

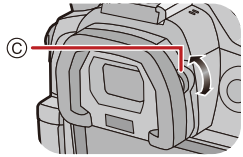
Switching the Monitor/Viewfinder manually

Press [LVF].

[LVF]/[Fn5] button can be used in two ways, as [LVF] or as [Fn5] (function 5). At the time of purchase, it is initially set to [LVF/Monitor Switch].
- Refer to P42 for details about the function button.

Diopter adjustment

Adjust the diopter to suit your vision so that you can see the characters displayed in the viewfinder clearly.



Ⓒ Diopter adjustment dial

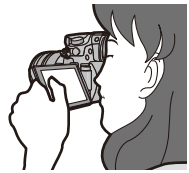
About the Eye Sensor AF

If [Eye Sensor AF] in the [Custom] menu is set to [ON], the camera automatically adjusts the focus as the eye sensor is activated.

- Beep sounds are not emitted when the focus is achieved in [Eye Sensor AF].
- [Eye Sensor AF] may not work in dimly lit conditions.
- The [Eye Sensor AF] feature is disabled in the following conditions:
 – With lenses that only offer Manual Focus
 – With some Four Third lenses

Setting the focus position with the Touch Pad

By setting [Touch Pad AF] in [Touch Settings] (P62) of the [Custom] menu, you can operate the Monitor as a touch pad when displaying the Viewfinder.



Item	Description of settings
[EXACT]	Moves the AF area of the Viewfinder by touching a desired position on the Touch Pad.
[OFFSET]	Moves the AF area of the Viewfinder by dragging (P15) the Touch Pad.
[OFF]	—

- Press the shutter button halfway to determine the focus position.
 If you press [DISP.] before determining the focus position, the AF area frame returns to the center position.
- To cancel the AF area frame when the Auto Focus Mode (P141) is set to [] ([Face Detection]), [] ([AF Tracking]) or [] ([23-Area]), press [MENU/SET].

- The Touch Shutter function (P70) is disabled when using [Touch Pad AF].

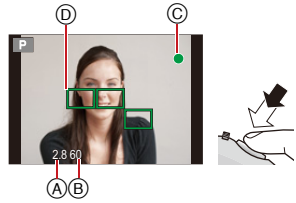
Taking a Still picture

• Set the drive mode dial to [▭] (single).

1 Select the Recording Mode. (P84)

2 Press the shutter button halfway to focus.

Ⓐ Aperture value
Ⓑ Shutter speed



- Aperture value and shutter speed are displayed. (It will flash in red if the correct exposure is not achieved, except when set to flash.)
- **When the image is correctly focused, the picture will be taken, since the [Focus/Release Priority] (P55) is set initially to [FOCUS].**

Focus Mode		AFS	
Focus		When the subject is focused	When the subject is not focused
Focus indication	Ⓒ	On	Blinks
AF area	Ⓓ	Green	—
Sound		Beeps 2 times	—

Focus Mode		AFF/AFC	
Focus		When the subject is focused	When the subject is not focused
Focus indication	Ⓒ	On	Blinks or Off
AF area	Ⓓ	Green*1	—
Sound		Beeps 2 times*2	—

*1 When AF Mode is set to [▤], the first AF area at which focus is achieved may be displayed momentarily while pressing halfway.
*2 A beep will be emitted when focus is first achieved during the pressing halfway.

- When the brightness is insufficient for [AFF] or [AFC], the camera will operate as if [AFS] has been set. In this case, the display will change to the yellow [AFS].

3 Press the shutter button fully (push it in further), and take the picture.



- If you zoom in/out after focusing on a subject, the focus may lose its accuracy. In that case, re-adjust the focus.
- The focus range is different depending on the lens used.
 – When the interchangeable lens (H-HS12035) is used: 0.25 m (0.82 feet) to ∞
 – When the interchangeable lens (H-VS014140) is used: 0.5 m (1.6 feet) to ∞

■ Subjects and recording conditions which are difficult to focus

- Fast-moving subjects, extremely bright subjects or subjects without contrast.
- When recording subjects through windows or near shiny objects.
- When it is dark or when jitter occurs.
- When the camera is too close to the subject or when taking a picture of both distant and near subjects.

Taking pictures using the Touch Shutter function

Just by touching the subject you want as your point of focus, the camera will focus on the subject and take the picture automatically.

1 **Touch [].**



2 **Touch [].**

- Icon will change to [], and taking a picture with the Touch Shutter function becomes possible.



3 **Touch the subject you wish to focus on, and then take a picture.**

- The picture is taken when the focus is achieved.
- If the histogram is displayed on top of the subject you want to touch, touch the subject after first moving the histogram by dragging it (P15).

■ To cancel the Touch Shutter function

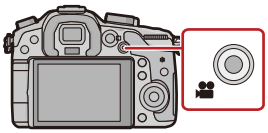
Touch [].

- If shooting with the touch shutter fails, the AF area turns red and disappears. In that case, try again.
- Measurement of brightness is performed on the spot touched when the [Metering Mode] (P162) is set to []. At the edge of the screen, the metering may be affected by the brightness around the touched location.

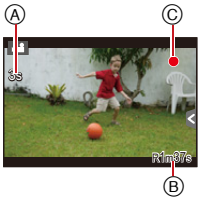
Recording Motion Picture

This can record full high definition motion pictures compatible with the AVCHD format or motion pictures recorded in MP4, MOV.
Audio will be recorded in stereo.

1 Start recording by pressing the motion picture button.



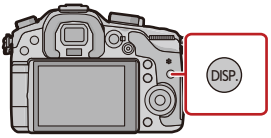
Ⓐ Elapsed recording time
Ⓑ Available recording time



- Recording of motion picture appropriate for each mode is possible.
- The recording state indicator (red) Ⓒ will flash while recording motion pictures.
- If approximately 10 seconds elapses without an operation being performed, part of the display will disappear. Press [DISP.] or touch the monitor to make the display reappear.
- When recording a motion picture, do not cover the microphone with your fingers or other objects.
- Release the motion picture button right after you press it.

2 Stop the recording by pressing the motion picture button again.

Switching the Information Displayed on the recording screen

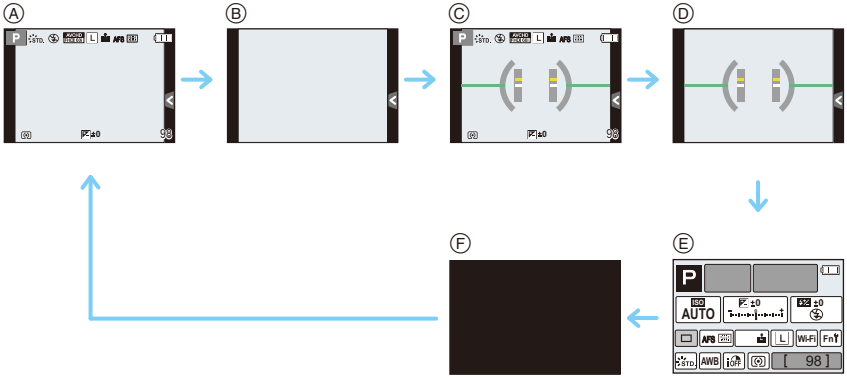


Press [DISP.] to change.

- You can select between [▭] (monitor style) and [▭] (viewfinder style) for each of the monitor and the viewfinder display screen using [Monitor Disp. Style] and [LVF Disp.Style] in the [Custom] menu.

([▭] monitor style)

- Screen will switch as follows:
 (Example of monitor display)



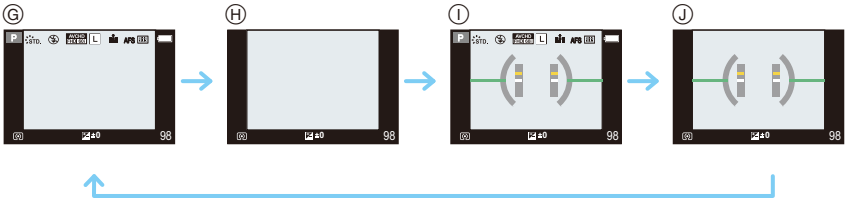
Ⓐ With information*1
Ⓑ Without information
Ⓒ With information (tilt sensor display)*1
Ⓓ Without information (tilt sensor display)
Ⓔ On-monitor recording information*2
Ⓕ Turned off

*1 Histograms are displayed when the [Histogram] of the [Custom] menu is set to [ON].
It is also possible to display the Exposure meter by setting the [Expo.Meter] of the [Custom] menu to [ON]. (P58)

*2 It is displayed when the [Monitor Info. Disp.] of the [Custom] menu is set to [ON]. (P59)
Settings can be adjusted directly by touching each of the items displayed on the screen.

([] viewfinder style)

• Screen will switch as follows:
(Example of display on viewfinder)



Ⓖ With information (detailed information)*1
Ⓗ With information
Ⓘ With information (detailed information, tilt sensor display)*1
Ⓙ With information (tilt sensor display)

*1 Histograms are displayed when the [Histogram] of the [Custom] menu is set to [ON].
It is also possible to display the Exposure meter by setting the [Expo.Meter] of the [Custom] menu to [ON]. (P58)

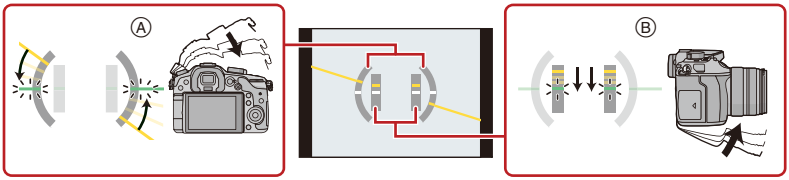
• If approximately 10 seconds elapses without an operation being performed, part of the display will disappear. Press [DISP.] or touch the monitor to make the display reappear.

About the tilt sensor display

With the tilt sensor displayed, it is easy to correct the tilt of the camera etc.

1 **Press [DISP.] to display the tilt sensor.**

2 **Check the tilt of the camera.**



Ⓐ Horizontal direction:
Correcting tilt to the left

Ⓑ Vertical direction:
Correcting downward tilt

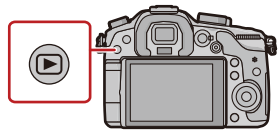
- When the tilt of the camera is little, the indicator changes to green.
- When recording with a vertical orientation, the display automatically switches to a vertically orientated display.

- Even after correcting the tilt, there may still be an error of approximately ± 1°.
- When [Fn Button Set] of the [Custom] menu is set to [Level Gauge], you can switch the tilt sensor display on/off by pressing function button.
- Tilt sensor display may not be displayed correctly when this unit is in motion.
- When tilted significantly upwards or downwards to record, the tilt sensor display may not be displayed correctly, and the Direction Detection Function (P65) may not work correctly.

Playing Back Pictures/Motion Pictures

Playing Back Pictures

1 **Press [▶].**



2 **Press ◄ or ►.**



◄: Play back the previous picture
►: Play back the next picture

- If you press and hold ◄/►, you can play back the pictures in succession.
- It is also possible to forward or rewind the image by rotating the control dial.
- It is also possible to forward or rewind the image by dragging the screen horizontally.
- You can forward or rewind pictures continuously by keeping your finger on the left or right sides of the screen after forwarding/rewinding a picture.
 (Pictures are displayed reduced in size)
- Speed of picture forwarding/rewinding changes depending on the playback status.

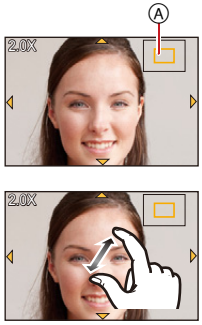
■ To finish playback

Press [▶] again, press the motion picture button or press the shutter button halfway.

- This camera complies with the DCF standard “Design rule for Camera File system” established by JEITA “Japan Electronics and Information Technology Industries Association” and with Exif “Exchangeable Image File Format”. This camera can only display pictures that comply with the DCF standard.
- Pictures recorded with another camera may not be able to play back on this unit.

Using the Playback Zoom

Rotate the rear dial right.

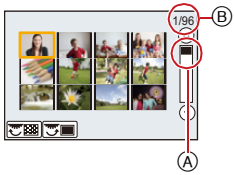


1× → 2× → 4× → 8× → 16×

- When you change the magnification, the zoom position indication Ⓐ appears for about 1 second.
- The more a picture is enlarged, the more its quality deteriorates.
- You can move the enlarged part by pressing ▲/▼/◄/► of the cursor button or dragging the screen. (P15)
- You can also enlarge (2×) the image by double-touching the part you want to enlarge. If you double-touch the enlarged image, the magnification is reset to 1×.
- You can also enlarge/reduce the image by pinching out/pinching in (P15) on the part you want to enlarge/reduce.
- You can forward or rewind the image while maintaining the same zoom magnification and zoom position for the Playback Zoom by rotating the control dial during Playback Zoom.

Displaying multiple screens (Multi Playback)

Rotate the rear dial left.



1 screen → 12 screens → 30 screens → Calendar screen display

- It is possible to switch the playback screen by touching the following icons.
 - –[▬]: 1 screen
 - –[▦]: 12 screens
 - –[▩]: 30 screens
 - –[CAL]: Calendar screen display
- Screen can be switched by dragging the slide bar up or down.

Ⓐ Slide bar
Ⓑ Number of the selected picture and the total number of recorded pictures

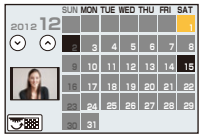
- The screen can be switched gradually by dragging the screen up or down.
- Pictures displayed using [!] cannot be played back.

■ To return to Normal Playback

Press ▲/▼/◄/► to select a picture and then press [MENU/SET].

Displaying Pictures by Recording Date (Calendar Playback)

1 Rotate the rear dial left to display the Calendar screen.



2 Press ▲/▼/◄/► to select the date to be played back.
- If there were no pictures recorded during a month, that month is not displayed.

3 Press [MENU/SET] to display the images that are recorded in selected date.
- Rotate the rear dial left to return to the Calendar screen display.

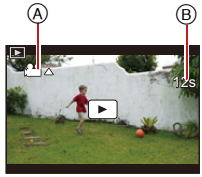
4 Press ▲/▼/◄/► to select a picture and then press [MENU/SET].

- The recording date of the picture selected in the playback screen becomes the date selected when the Calendar screen is first displayed.
- If there are multiple pictures with the same recording date, the first picture recorded on that day is displayed.
- You can display the Calendar between January 2000 and December 2099.
- If the date is not set in the camera, the recording date is set as January 1st, 2012.
- If you take pictures after setting the travel destination in [World Time], the pictures are displayed by the dates at the travel destination in Calendar Playback.

Playing Back Motion Pictures

This unit was designed to play motion pictures using the AVCHD, MP4, MOV and QuickTime Motion JPEG formats.

In Playback Mode, select a picture with the motion picture icon ([🎥]), and then press ▲ to play back.



Ⓐ Motion picture icon
Ⓑ The motion picture recording time

- After playback starts, the elapsed playback time is displayed on the screen.
 For example, 8 minutes and 30 seconds is displayed as [8m30s].
- Some information (recording information, etc.) is not displayed for motion pictures recorded in [AVCHD].
- Touching [►] in the middle of the screen allows you to play back motion pictures.

■ Operations performed during Motion Picture Playback

Display at the right of the screen while playing back corresponds to ▲/▼/◄/► on the cursor button.

▲	▶/❚❚	Play/Pause	▼	■	Stop
◄	◀◀	Fast rewind*	►	▶▶	Fast forward*
	◀❚❚	Frame-by-frame rewind (while pausing)		❚❚▶	Frame-by-frame forward (while pausing)
Control dial (left)	−	Reduce volume level	**Control dial (right)**	+	Increase volume level

- Control panel disappears after approximately 2 seconds if no operation is performed. Touch the screen to redisplay the control panel.

* The fast forward/rewind speed increases if you press ►/◄ again.

- When using a high capacity card, it is possible that fast rewinding may be slower than usual.
- To play back the motion pictures recorded by this unit on a PC, use the “PHOTOfunSTUDIO” software on the CD-ROM (supplied).
- Motion pictures recorded with other camera may not be able to play back on this unit.
- Motion pictures recorded with [Miniature Effect] in Creative Control Mode play back at approximately 10 times speed.

Creating Still Pictures from a Motion Picture

You can create a single still picture from a recorded motion picture.

1 **Press ▲ to pause motion picture playback.**

2 **Press [MENU/SET].**

- The same operation can be performed by touching [].
- Confirmation screen is displayed. It is executed when [Yes] is selected.



- It will be saved with [Picture Size] set to [S] (2 M), [Aspect Ratio] set to [16:9], and [Quality] set to [].
- Still pictures created from a motion picture may be coarser than with normal picture quality.
- While recording [MP4], using [VGA/30p], the ability to create still pictures is disabled.
- You may not be able to save still pictures from a motion picture taken on other equipment.
- [] is displayed during playback of still pictures created from motion pictures.

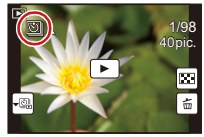
Playing Back Group Pictures

A picture group consists of multiple pictures. You can play back pictures in a group either continuously or one by one.

[]:
A picture group consisting of pictures taken in the Burst Mode with the burst speed [SH]. (P153)



[]:
A picture group consisting of pictures taken in a single Time Lapse Shot. (P166)



- You can edit or delete all pictures in a group at once. (For example, if you delete a picture group, all pictures in the group are deleted.)

- Pictures recorded after the number of pictures has exceeded 50000 will not be grouped.
- Pictures recorded on other cameras may not be recognized as a Picture Group.
- Pictures will not be grouped if recorded without setting the clock.

Continuously playing back Group Pictures

Select a picture with the group picture icon ([], []), and then press ▲.

• You can also start playing back by touching [] at the center of the screen.

■ Operations during Group Pictures playback

Display at the right of the screen while playing back corresponds to ▲/▼/◀/▶ on the cursor button.

▲	▶/❚❚	Continuous playback/ Pause	▼	■	Stop
◀	◀◀	Fast rewind	▶	▶▶	Fast forward
	⏮	Rewind (while pausing)		⏭	Forward (while pausing)

Playing back each Group Pictures



1 **Select a picture with the group picture icon ([], []), and then press ▼.**

• You can also start playing back by touching [] or [].

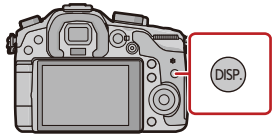
2 **Press ◀/▶ to flip through images.**

• Touch [] or press ▼ again to return to the normal playback screen.

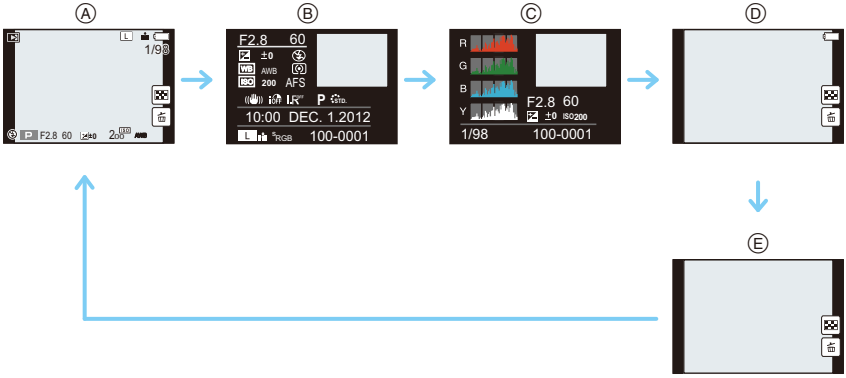
• Each picture in a group can be treated same as normal pictures when they are played back. (Such as Multi Playback, Playback Zoom and deleting images)

Changing the information displayed on the playback screen

Press [DISP.] to switch the monitor screen.



• Screen will switch as follows:



Ⓐ With information[*1]
Ⓑ Detailed information display[*2] (P273)
Ⓒ Histogram display[*2] (P273)
Ⓓ Without information (Highlight display)[*1, 2, 3, 4]
Ⓔ Without information[*4]

*1 If approximately 10 seconds elapses without an operation being performed, part of the display will disappear. Press [DISP.] or touch the monitor to make the display reappear.
*2 It is not displayed during the Playback Zoom, while playing back a motion picture, or during slide show.
*3 This is displayed if [Highlight] (P58) in the [Custom] menu is set to [ON].
*4 If no operation is performed for a number of seconds, [🗑] and other touch icons will disappear.

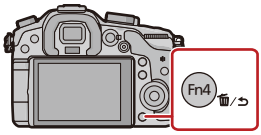
• Histogram is displayed in R (red), G (green), B (blue), and Y (luminance) during the playback.

Deleting Pictures

Once deleted, pictures cannot be recovered.
• Pictures that are not in the DCF standard or those that are protected cannot be deleted.

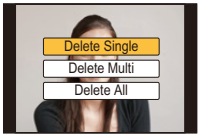
To delete a single picture

1 **In Playback Mode, select the picture to delete and then press [🗑/↩].**



• The same operation can be performed by touching [🗑].

2 **Press ▲ to select [Delete Single] and then press [MENU/SET].**



• Confirmation screen is displayed.
Pictures are deleted by selecting [Yes].

To delete multiple pictures (up to 100*) or all the pictures

* Picture groups are treated as a single picture. (All the pictures in the selected picture group will be deleted.)

1 In Playback Mode, press [🗑/↩].

2 Press ▲/▼ to select [Delete Multi] or [Delete All] and then press [MENU/SET].

- [Delete All] → Confirmation screen is displayed. Pictures are deleted by selecting [Yes].
- It is possible to delete all pictures except the ones set as favorite when [All Delete Except Favorite] is selected with the [Delete All] set.

3 (When [Delete Multi] is selected) Press ▲/▼/◄/► to select the picture, and then press [MENU/SET] to set. (Repeat this step.)



- [🗑] appears on the selected pictures. If [MENU/SET] is pressed again, the setting is canceled.

4 (When [Delete Multi] is selected) Press ◄ to select [OK], and then press [MENU/SET] to execute.

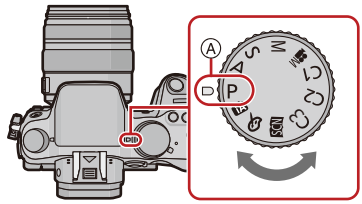
- Confirmation screen is displayed. Pictures are deleted by selecting [Yes].

- Do not turn the camera off while deleting. Use a battery with sufficient battery power or the AC adaptor (optional).
- Depending on the number of pictures to be deleted, it may take some time to delete them.

Selecting the Recording Mode

Select the mode by rotating the mode dial.

- **Rotate the mode dial slowly to select the desired mode Ⓐ.**



P	**Program AE Mode (P85)**
Records at the aperture value and shutter speed set by the camera.	
A	**Aperture-Priority AE Mode (P87)**
The shutter speed is automatically determined by the aperture value you set.	
S	**Shutter-Priority AE Mode (P88)**
The aperture value is automatically determined by the shutter speed you set.	
M	**Manual Exposure Mode (P89)**
The exposure is adjusted by the aperture value and the shutter speed which are manually adjusted.	
M	**Creative Video Mode (P184)**
Allows you to set the aperture value and shutter speed and record motion pictures with slow and quick effects. ＊ You cannot take still pictures.	
C1 C2 C3	**Custom Mode (P115)**
Use this mode to take pictures with previously registered settings.	
SCN	**Scene Guide Mode (P92)**
This allows you to take pictures that match the scene being recorded.	
	Creative Control Mode (P101)
Record while checking the image effect.	
iA	**Intelligent Auto Mode (P109)**
The subjects are recorded using settings automatically selected by the camera.	
iA+	**Intelligent Auto Plus Mode (P113)**
Allows you to adjust the brightness and color hue when in Intelligent Auto Mode.	

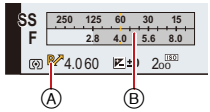
Taking Pictures with Your Favorite Settings
(Program AE Mode)

Recording Mode: [P]

The camera automatically sets the shutter speed and the aperture value according to the brightness of the subject.
You can take pictures with greater freedom by changing various settings in the [Rec] menu.

1 Set the mode dial to [P].

2 Press the shutter button halfway and display the aperture value and shutter speed value on the screen.



- The shutter speed is automatically set between about 15 seconds and 1/4000th of a second in the following cases.
 – When the [Sensitivity] is set to [ISO200].
 – When the aperture value is set to F2.8 [when the interchangeable lens (H-HS12035) is attached].
 – When the aperture value is set to F4.0 [when the interchangeable lens (H-VS014140) is attached].

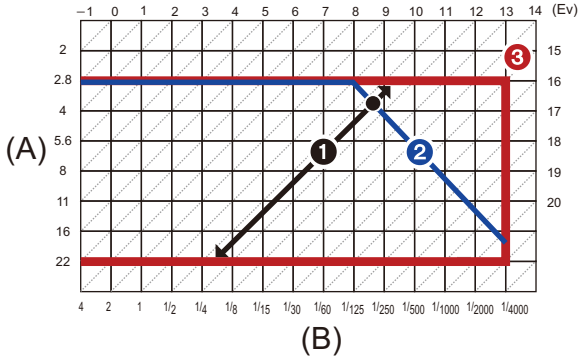
3 While the values are displayed (about 10 seconds), perform Program Shift by rotating the rear dial or front dial.

- Rotate the front/rear dial to display [Expo.Meter] Ⓑ. (P58)
- The Program Shift indication Ⓐ appears on the screen.
- To cancel Program Shift, turn off this unit or rotate the front/rear dial until the Program Shift indication disappears.
 Program Shift is easily canceled by setting [Fn Button Set] on the [Custom] menu to [One Push AE]. (P43)

Program Shift

In Program AE Mode, you can change the preset aperture value and shutter speed without changing the exposure. This is called Program Shift.
You can make the background more blurred by decreasing the aperture value or record a moving subject more dynamically by slowing the shutter speed when taking a picture in Program AE Mode.

Example of Program Shift
[When the interchangeable lens (H-HS12035) is used]



(A): Aperture value
(B): Shutter speed
❶ Program Shift amount
❷ Program Shift line chart
❸ Program Shift limit

- EV is an abbreviation of [Exposure Value].
 The EV changes with the aperture value or the shutter speed.
- If the exposure is not adequate when the shutter button is pressed halfway, the aperture value and shutter speed turn red and blink.
- Program Shift is canceled and the camera returns to normal Program AE Mode if more than 10 seconds pass after Program Shift is activated. However, the Program Shift setting is memorized.
- Program Shift will only allow adjustments to be made when there is an adequate amount of light.
- Program Shift is available in all [Sensitivity] settings except [ISO].

Taking Pictures by Specifying the Aperture/ Shutter Speed

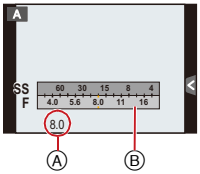
Recording Mode: A S M

Aperture-Priority AE Mode

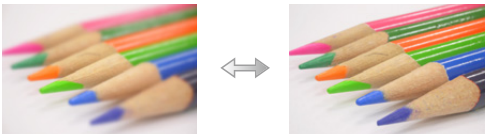
Set the aperture value to a higher number when you want a sharp focus background. Set the aperture value to a lower number when you want a soft focus background.

1 **Set the mode dial to [A].**

2 **Set the aperture value by rotating the rear dial or the front dial.**



Ⓐ Aperture value
Ⓑ Exposure meter



Aperture value: Reduces
It becomes easier to defocus the background.

Aperture value: Increases
It becomes easier to maintain focus as far as the background.

- The effects of the set aperture value will not be visible on the recording screen. To check on the recording screen, please use [Preview]. (P91)

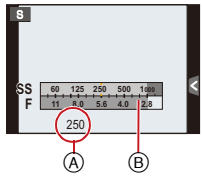
- The brightness of the screen and the recorded pictures may differ. Check the pictures on the playback screen.
- Rotate the front/rear dial to display the [Expo.Meter]. Unsuitable areas of the range are displayed in red.
- If the exposure is not adequate, the aperture value and the shutter speed turn red and blink when the shutter button is pressed halfway.
- When using a lens having an aperture ring, set the position of the aperture ring to [A] to activate the front/rear dial settings. At positions other than [A], the ring setting takes priority.

Shutter-Priority AE Mode

When you want to take a sharp picture of a fast moving subject, set with a faster shutter speed. When you want to create a trail effect, set to a slower shutter speed.

1 **Set the mode dial to [S].**

2 **Set the shutter speed by rotating the rear dial or the front dial.**



Ⓐ Shutter speed
Ⓑ Exposure meter



Shutter speed: Slow
It becomes easier to express movement.

Shutter speed: Fast
It becomes easier to freeze movement.

- The effects of the set shutter speed will not be visible on the recording screen. To check on the recording screen, please use [Preview]. (P91)

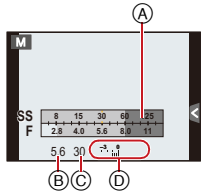
- The brightness of the screen and the recorded pictures may differ. Check the pictures on the playback screen.
- Rotate the front/rear dial to display the [Expo.Meter]. Unsuitable areas of the range are displayed in red.
- If the exposure is not adequate, the aperture value and the shutter speed turn red and blink when the shutter button is pressed halfway.
- Display of the shutter speed will count down when the shutter speed is set slow and the shutter button is pressed all the way.
- We recommend using a tripod when the shutter speed is slow.
- When the flash is activated, the fastest shutter speed that can be selected is 1/160th of a second. (P125)
- The shutter speed slower than 1 second is not available when [Electronic Shutter] is set to [ON].
- The [Sensitivity] is automatically set to [AUTO] when you switch the Recording Mode to Shutter-Priority AE Mode while the [Sensitivity] is set to [ISO] (Intelligent).

Manual Exposure Mode

Determine the exposure by manually setting the aperture value and the shutter speed. The Manual Exposure Assistance appears on the lower portion of the screen to indicate the exposure.

1 **Set the mode dial to [M].**

2 **Rotate the rear dial to set the shutter speed, and rotate the front dial to set the aperture value.**



Ⓐ Exposure meter
Ⓑ Aperture value
Ⓒ Shutter speed
Ⓓ Manual Exposure Assistance

Aperture value	 **Reduces** It becomes easier to defocus the background.	 **Increases** It becomes easier to maintain focus as far as the background.
Shutter speed	 **Slow** It becomes easier to express movement.	 **Fast** It becomes easier to freeze movement.

Manual Exposure Assistance

	The exposure is adequate.
	Set to faster shutter speed or larger aperture value.
	Set to slower shutter speed or smaller aperture value.

• The Manual Exposure Assistance is an approximation. We recommend checking the pictures on the playback screen.

About [B] (Bulb)

If you set the shutter speed to [B], the shutter stays open while the shutter button is pressed fully (up to approximately 60 minutes).
The shutter closes if you release the shutter button.
Use this when you want to keep the shutter open for a long time to take pictures of fireworks, a night scene etc.

- We recommend using a tripod or the remote shutter (DMW-RSL1: optional) when you take pictures with the shutter speed set to [B]. Refer to P268 for information about the remote shutter.
- If you set the shutter speed to [B], [B] is displayed on the screen.
- When you take pictures with the shutter speed set to [B], use a sufficiently charged battery. (P24)
- When you take pictures with the shutter speed set to [B], noise may become visible. To avoid picture noise, we recommend setting [Long Shtr NR] in the [Rec] menu to [ON] before taking pictures. (P169)
- The Manual Exposure Assistance does not appear.
- This cannot be used when [Electronic Shutter] is set to [ON].
- It can only be used with Manual Exposure Mode.

Constant preview

In Manual Exposure Mode, when [Constant Preview] in the [Custom] menu is [ON], you will be able to confirm the effects of aperture and shutter speed on the screen. (P91)

- Close the flash.
- It can only be used with Manual Exposure Mode.

- The brightness of the screen and the recorded pictures may differ. Check the pictures on the playback screen.
- Rotate the front/rear dial to display the [Expo.Meter]. Unsuitable areas of the range are displayed in red.
- If the exposure is not adequate, the aperture value and the shutter speed turn red and blink when the shutter button is pressed halfway.
- Display of the shutter speed will count down when the shutter speed is set to slow and the shutter button is pressed all the way.
- We recommend using a tripod when the shutter speed is slow.
- When the flash is activated, the fastest shutter speed that can be selected is 1/160th of a second. (P125)
- The shutter speed slower than 1 second is not available when [Electronic Shutter] is set to [ON].
- The [Sensitivity] is automatically set to [ISO200] when you switch the Recording Mode to Manual exposure while the [Sensitivity] is set to [AUTO] or [iISO] (Intelligent).
- When you use a lens with an aperture ring, the aperture ring setting takes priority.

Confirm the Effects of Aperture and Shutter Speed (Preview Mode)

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

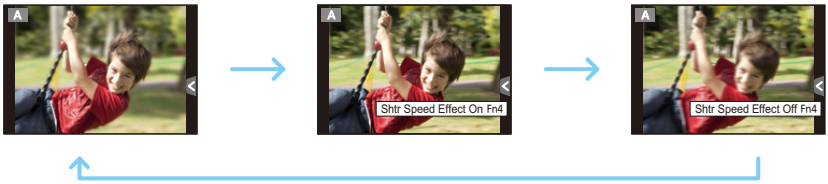
The effects of aperture and shutter speed can be checked by using the Preview Mode.

- **Confirm the effects of aperture:** You can check the depth of field (effective focus range) before taking a picture by closing the leaf shutter to the aperture value you set.
- **Confirm the effects of shutter speed:** Movement can be confirmed by displaying the actual picture that will be taken with that shutter speed. When the shutter speed is set for high speed, display in the shutter speed preview will be displayed like a time-release film. It is used in cases such as stopping the movement of running water.

1 **Set [Fn Button Set] in the [Custom] menu to [Preview].** (P42)
- The following step is an example in which [Preview] is assigned to [Fn4].

2 **Switch to confirmation screen by pressing [Fn4].**
- Screen is switched every time [Fn4] is pressed.

Normal recording screen → **Effects of Aperture** → **Effects of Shutter Speed**



Depth of field properties

∗1	Aperture value	Small	Large
	Focus length of the lens	Tele	Wide
	Distance to the subject	Near	Distant
Depth of field (effective focus range)		Shallow (Narrow)∗2	Deep (Wide)∗3

∗1 Recording conditions
∗2 Example: When you want to take a picture with a blurred background etc.
∗3 Example: When you want to take a picture with everything in focus including the background etc.

- It is possible to record while in Preview Mode.
- Range for shutter speed effect check is 8 seconds to 1/1000th of a second.

Taking Pictures that match the Scene being recorded (Scene Guide Mode)

Recording Mode: [SCN]

If you select a scene to suit the subject and recording conditions with reference to the example images, the camera will set optimal exposure, color, and focus, allowing you to record in a manner appropriate to the scene.

1 **Set the mode dial to [SCN].**

2 **Press ◄/► to select the scene.**

- You can also select the scene by dragging the example images.



3 **Press [MENU/SET] to set.**

■ To enjoy a variety of picture effects

Press [DISP.] or touch [DISP.] on the scene selection screen to display explanations etc. for picture effects to suit the scene. To take full advantage of the picture effects, we recommend that you read the explanations and try recording pictures.

- To change Scene Guide Mode, select the [SCN] tab on the menu screen, select [Scene Switch], and then press [MENU/SET]. You can return to step **2** above.
- The following items cannot be set in Scene Guide Mode because the camera automatically adjusts them to the optimal setting.
 – Items other than the picture quality adjustment in [Photo Style]/[Sensitivity]/[Metering Mode]/[HDR]/[Digital Zoom]/[Multi Exp.]
- Although white balance is fixed to [AWB] for certain types of scene, you can fine tune the white balance or use white balance bracketing by pressing [WB] on the recording screen. For further details, please read P136, 139.

For details on “Scene Guide Mode” settings, refer to P92.

[Clear Portrait]



The brightness of the face is adjusted and the background is defocused to create a clear portrait.

- If you are using a lens with the zoom function, you can enhance the effect by zooming in as much as possible and closing the distance between the camera and the subject.

[Silky Skin]



Brighter face and softer skin color creates a healthy younger look.

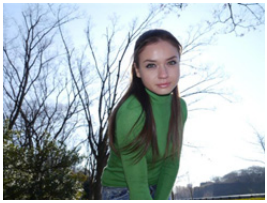
- If you are using a lens with the zoom function, you can enhance the effect by zooming in as much as possible and closing the distance between the camera and the subject.
- The smoothing effect is applied to the part that has a similar tone to the complexion of a subject, as well.
- This mode may not be effective under insufficient lighting.

[Backlit Softness]



When backlighted, the overall screen brightness is increased. Portraits are softened and infused with light.

[Clear in Backlight]



Outdoors, the flash will be used to more evenly illuminate the subject's face.

- **Open the flash. (You can set to [ϟ].)**
- White saturation can occur if the subject is too close.
- Flash pictures taken closer or beyond the flash's rated distance may appear too bright or too dark.

[Relaxing Tone]



The warm color tone creates an image with a relaxing mood.

[Sweet Child's Face]



Moderate background defocusing and skin tone highlighted draws attention to the child's face.

Touch the face.

- A still picture is recorded with the focus and exposure set for the touched location.
- If you are using a lens with the zoom function, you can enhance the effect by zooming in as much as possible and closing the distance between the camera and the subject.

[Distinct Scenery]



Saturation of sky and trees creates more distinct scenery.

[Bright Blue Sky]



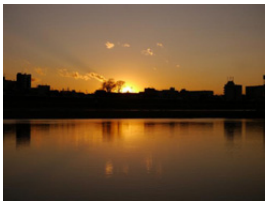
On a sunny day, the overall screen brightness is increased to create a vibrant image of the blue sky.

[Romantic Sunset Glow]



The enhanced purple tone creates a romantic image of the sky just after sunset.

[Vivid Sunset Glow]



Red is enhanced to create a vivid image of the sunset.

[Glistening Water]



The glisten of the water is enhanced to look brighter and slightly bluish.

- Display of the recording screen will be delayed more than usual and the screen will look as if frames are dropping.
- Star filter used in this mode may cause glistening effects on the objects other than water surface.

[Clear Nightscape]



Color saturation of the night light is increased to accentuate the nightscape.

- We recommend using a tripod and the self-timer.
- The shutter may remain closed after taking the picture. This is due to signal processing and is not a malfunction.
- Noise may become visible when you take pictures in dark places.

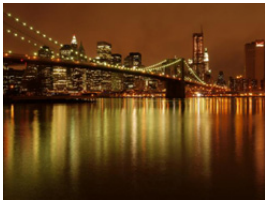
[Cool Night Sky]



Blue tones are enhanced to create a cool and sophisticated image of the night sky after sunset.

- We recommend using a tripod and the self-timer.
- The shutter may remain closed after taking the picture. This is due to signal processing and is not a malfunction.
- Noise may become visible when you take pictures in dark places.

[Warm Glowing Nightscape]



The warm color tone creates a warm image of the nightscape.

- We recommend using a tripod and the self-timer.
- The shutter may remain closed after taking the picture. This is due to signal processing and is not a malfunction.
- Noise may become visible when you take pictures in dark places.

[Artistic Nightscape]



A slow shutter speed captures light trails that can creates an artistic nightscape.

- We recommend using a tripod and the self-timer.
- The shutter may remain closed after taking the picture. This is due to signal processing and is not a malfunction.
- Noise may become visible when you take pictures in dark places.

[Glittering Illuminations]



The star filter enhances pinpoints of light.

- We recommend using a tripod and the self-timer.
- Display of the recording screen will be delayed more than usual and the screen will look as if frames are dropping.
- The shutter may remain closed after taking the picture. This is due to signal processing and is not a malfunction.
- Noise may become visible when you take pictures in dark places.

[Clear Night Portrait]



Fill flash and a longer exposure capture better portraits against the nightscape.

- **Open the flash. (You can set to [⚡S👁].)**
- We recommend using a tripod and the Self-timer for taking pictures.
- When [Clear Night Portrait] is selected, keep the subject still for about 1 second after taking the picture.
- The shutter may remain closed after taking the picture. This is due to signal processing and is not a malfunction.
- Noise may become visible when you take pictures in dark places.

[Soft Image of a Flower]



The soft focus creates a diffused image.

- We recommend using a tripod and the self-timer.
- For close-up recording, we recommend that you close the flash and avoid using it.
- Display of the recording screen will be delayed more than usual and the screen will look as if frames are dropping.
- The focus range is different depending on lens used. Refer to “About the focus distance reference mark” on P150 for the focus range.
- When a subject is close to the camera, the effective focus range is significantly narrowed. Therefore, if the distance between the camera and the subject is changed after focusing on the subject, it may become difficult to focus on it again.
- Close-up regions are prioritized when taking pictures, and so time is required to focus if you take a picture of a distant subject.
- When you take pictures at close range, the resolution of the periphery of the picture may decrease slightly. This is not a malfunction.
- If the lens becomes dirty with fingerprints or dust, the lens may not be able to focus on the subject correctly.

[Appetizing Food]



The overall screen brightness is increased to make the food look appealing.

- If you are using a lens with the zoom function, you can enhance the effect by zooming in as much as possible and closing the distance between the camera and the subject.
- We recommend using a tripod and the self-timer.
- For close-up recording, we recommend that you close the flash and avoid using it.

[Cute Dessert]



The overall screen brightness is set higher to enhance the cuteness of the dessert.

- If you are using a lens with the zoom function, you can enhance the effect by zooming in as much as possible and closing the distance between the camera and the subject.
- We recommend using a tripod and the self-timer.
- For close-up recording, we recommend that you close the flash and avoid using it.

[Freeze Animal Motion]



The faster shutter speed prevents blur and captures a clear image of the fast moving animal.

[Clear Sports Shot]



The faster shutter speed prevents blur, for example at sporting events.

[Monochrome]



A monochrome image captures the mood of the moment.

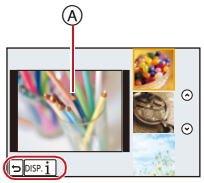
Taking Pictures with different image effects (Creative Control Mode)

Recording Mode:

This mode records with additional image effects. You can set the effects to add by selecting example images and checking them on the screen.

1 **Set the mode dial to [].**

2 **Press ▲/▼ to select the image effects (filters).**



- The image effect of the selected example image will be applied in a preview display Ⓐ.
- You can also select the image effects (filters) by touching the example images.
- Press [DISP.] or touch [DISP.] to display the explanation for the selected image effect.

3 **Press [MENU/SET] to set.**

- To change Creative Control Mode, select the [] tab on the menu screen, select [Filter Switch], and then press [MENU/SET]. You can return to step **2** above.
- Creative Control settings are memorized even if the camera is turned off.
- White Balance will be fixed to [AWB], and [Sensitivity] will be fixed to [AUTO].

Adjust the effect to fit your preferences

The strength and colors of the effects can be easily adjusted to fit your preferences.

1 **Press [WB].**

2 **Rotate the rear dial to adjust.**



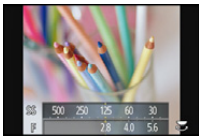
- The items that can be set differ depending on which Creative Control Mode is currently set.
 For information on each image effect, refer to “Items that can be set”.
- When making the effect setting, [] is displayed on the screen.
- If you cannot change the settings, select the center (standard).
- Press [WB] again to return to the recording screen.

Taking a picture with a blurred background (Defocus Control)

You can easily set the blurriness of the background while checking the screen.

1 **Press [Fn4].**

2 **Set the blurriness by rotating the rear dial.**
- If you press [MENU/SET], you can return to the recording screen.
(To end the Defocus Control function, press [Fn4].)



Setting brightness

1 **Press [].**

2 **Rotate the rear dial to adjust brightness.**
- Press [] again to return to the recording screen.



Change the settings by using the touch panel

❶ Touch [].

❷ Touch the item you want to set.

[]: Image effects

[]: Defocus level

[]: Brightness



❸ Drag the slide bar to set.
- If you press [MENU/SET], you can return to the recording screen.
(To end the Defocus Control function, press [Fn4].)

For details on “Creative Control Mode” settings, refer to P101.

[Expressive]



This effect emphasizes the color to make a pop art picture.

Items that can be set

Freshness	Understated colors	⇔	Pop colors

[Retro]



This effect gives a faded image.

Items that can be set

Color	Yellow emphasized	⇔	Red emphasized

[High Key]



This effect adds a bright, airy and soft feel to the overall image.

Items that can be set

Color	Pink emphasized	⇔	Aquamarine emphasized

[Low Key]



This effect adds a dark and relaxing feel to the overall image and enhances bright parts.

Items that can be set

Color	Red emphasized	⇔	Blue emphasized

[Sepia]



This effect creates a sepia image.

Items that can be set

Contrast	Low contrast	⇔	High contrast

[Dynamic Monochrome]



This effect gives a higher contrast to create an impressive black and white picture.

Items that can be set

Contrast	Low contrast	⇔	High contrast

[Impressive Art]



This effect gives your photo a dramatic contrast look.

Items that can be set

Freshness	Black and white	⇔	Pop colors

[High Dynamic]



This effect produces the optimum brightness for both dark and bright parts.

Items that can be set

Freshness	Black and white	⟺	Pop colors

[Cross Process]

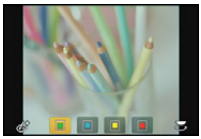


This effect gives your photo a dramatic color look.

Items that can be set

Color	Green tone/Blue emphasized/Yellow tone/ Red tone

• Select the desired color tone by rotating the rear dial, and then press [WB].



[Toy Effect]



This effect reduces peripheral brightness to give the impression of a toy camera.

Items that can be set

Color	Orange emphasized	⟺	Blue emphasized

[Miniature Effect]



This effect blurs peripheral areas to give the impression of a diorama.

Items that can be set

Freshness	Understated colors	⇔	Pop colors

■ Setting the type of defocus

With [Miniature Effect] you can make the subject stand out by intentionally creating defocused and in-focus portions. You can set the recording orientation (defocus orientation) and the position and size of the in-focus portion.

1 Press ▲ to display the setting screen.

- Setting screen can also be displayed by touching in order of [] then [].

2 Press ▲/▼ or ◄/► to move the in-focus portion.



- You can also move the in-focus portion by touching the screen on the recording screen.
- Touching [] allows you to set the recording orientation (defocus orientation).

3 Rotate the rear dial to change the size of in-focus portion.

- The area size can also be changed by pinching out/pinching in (P15) on the screen.
- If you press [DISP.] or touch [Reset], settings for the non-blurred portions are restored to the initial settings.

4 Press [MENU/SET] to set.

- You can also set by touching [Set].

- Display of the recording screen will be delayed more than usual and the screen will look as if frames are dropping.
- No sound is recorded in motion pictures.
- Approximately 1/10 of the time period is recorded. (If you record for 10 minutes, the resulting motion picture recording will be approximately 1 minute long.)
 The displayed available recording time is approximately 10 times. When switching to Recording Mode, please check the available recording time.
- When the [Focus Mode] is set to [MF], move the focused location to the in-focus portion.

[Soft Focus]



This effect blurs the overall image to produce a soft feel.

Items that can be set

Extent of defocus	Weak defocus	⇔	Strong defocus

- Display of the recording screen will be delayed more than usual and the screen will look as if frames are dropping.

[Star Filter]



This effect transforms pin-points of light into a star effect.

Items that can be set

Length of shine	Short	⇔	Long

- Display of the recording screen will be delayed more than usual and the screen will look as if frames are dropping.

[One Point Color]



This effect leaves one selected color to emphasize impressiveness.

Items that can be set

Amount of color left	Small amount of color ⇔ Large amount of color

■ Select the color to leave in

1 Press ▲ to display the setting screen.

- Setting screen can also be displayed by touching in order of [] then [].

2 Select the color you want to leave by moving the frame with ▲/▼/◀/▶.

- You can also select the color you want to leave by touching the screen.
- Press [DISP.] or touch [Reset] to reset the frame position.



3 Press [MENU/SET] to set.

- You can also set by touching [Set].

• Depending on the subject, the set color may not be left in.

Taking Pictures using the Automatic Function
(Intelligent Auto Mode)

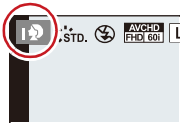
Recording Mode: iA iA+

In this mode, the camera makes the optimal settings for the subject and scene, so we recommend it when you wish to leave the settings to the camera and record without thinking about them.

1 Set the mode dial to [iA].

- The camera will switch to either the most recently used of Intelligent Auto Mode or Intelligent Auto Plus Mode. (P113)
 At the time of purchase, the mode is set to Intelligent Auto Plus Mode.

2 Align the screen with the subject.



- When the camera identifies the optimum scene, the icon of the scene concerned is displayed in blue for 2 seconds, after which its color changes to the usual red.
- When the subject is touched, AF Tracking function works. It is also possible by pressing [⊡], and then pressing the shutter button halfway. For details, refer to P144.

Scene Detection

When taking pictures

iA	→	[i-Portrait]
		[i-Scenery]
		[i-Macro]
		[i-Night Portrait]*1
		[i-Night Scenery]
		[i-Baby]*2
		[i-Sunset]

*1 Only when [iA] (AUTO) is selected.

*2 When [Face Recog.] is set to [ON], [] will be displayed for birthdays of registered faces already set only when the face of a person 3 years old or younger is detected.

When recording motion pictures

iA	→	[i-Portrait]
		[i-Scenery]
		[i-Low Light]
		[i-Macro]

- [iA] is set if none of the scenes are applicable, and the standard settings are set.
- When [], [] or [] is selected, the camera automatically detects a person's face, and it will adjust the focus and exposure. **(Face Detection)**
- If a tripod is used, for instance, and the camera has judged that camera shake is minimal when the Scene detection has been identified as [], the shutter speed will be slower than normal. Take care not to move the camera while taking pictures.
- An optimum scene for the specified subject will be chosen when set to AF tracking.
- When [Face Recog.] is set to [ON], and the face similar to the registered face is detected, [R] is displayed in the top right of [], [] and [].
- Due to conditions such as the ones below, a different scene may be identified for the same subject.
 - Subject conditions: When the face is bright or dark, the size of the subject, the color of the subject, the distance to the subject, the contrast of the subject, when the subject is moving
 - Recording conditions: Sunset, sunrise, under low brightness conditions, when the camera is shaken, when zoom is used
- To take pictures in an intended scene, it is recommended that you take pictures in the appropriate Recording Mode.

About the flash

Flash mode is set to [⊗] when the flash is closed, and [ᵢ⚡ᴬ] (AUTO) when it is open. When the flash is open, the camera automatically sets [ᵢ⚡ᴬ], [ᵢ⚡👁] (AUTO/Red-Eye Reduction), [ᵢ⚡ˢ], or [ᵢ⚡ˢ] to match the type of subject and brightness.

- **Open the flash when the flash is to be used.** (P123)
- When [ᵢ⚡👁] or [ᵢ⚡ˢ] is set, Digital Red-Eye Correction is enabled.
- Shutter speed will be slower during [ᵢ⚡ˢ] or [ᵢ⚡ˢ].

Functions that work automatically and menu options which are disabled

The following functions are performed automatically to allow the camera to make the optimal settings.

– Scene Detection/Backlight Compensation/Face Detection/Auto White Balance/ Intelligent ISO sensitivity control/[Red-Eye Removal]/[i.Resolution]/[i.Dynamic]/[Long Shtr NR]/[Shading Comp.]/[Quick AF]/[AF Assist Lamp]

Because the camera makes the optimal settings automatically, the following menus are disabled.

– For the [Rec] menu, see “Using the [Rec] Menu” in (P158). For the [Motion Picture] menu, see “Using the [Motion Picture] Menu” (P188).

– [Cust.Set Mem.]/[Expo.Meter]/[AF/AE Lock]/[AF/AE Lock Hold]/[Quick AF]/[Eye Sensor AF]/ [Direct Focus Area]/[Shutter AF]/[AF Assist Lamp]/[AF+MF] ([Custom] menu)

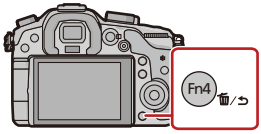
- **The Backlight Compensation**

– When there is a backlight, the subject appears darker and the camera will automatically attempt to correct it by increasing the brightness of the picture. In Intelligent Auto Mode, backlight compensation works automatically.

Taking a picture with a blurred background (Defocus Control)

You can easily set the blurriness of the background while checking the screen.

1 **Press [Fn4].**



2 **Set the blurriness by rotating the rear dial.**





Strong defocus



Weak defocus

- If you press [MENU/SET], you can return to the recording screen. (To end the Defocus Control function, press [Fn4].)

When operating the touch screen

❶ Touch [].

❷ Touch [] to display the setting screen.

❸ Drag the slide bar to set.

- If you press [MENU/SET], you can return to the recording screen. (To end the Defocus Control function, press [Fn4].)

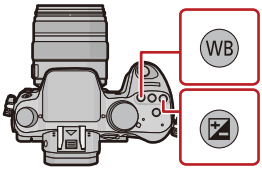


- On the Defocus Control setting screen of Intelligent Auto (or) Mode, the AF Mode is []. You can set the location of the AF area by touching the screen. (Size cannot be changed)
- Depending on the lens used, you may hear a sound from the lens when the Defocus Control is used, but this is due to operation of the aperture of the lens and it is not a malfunction.
- Depending on the lens used, operational sound of the Defocus Control may be recorded during the recording of a motion picture when the function is used.
- Depending on the lens used, Defocus Control function may not operate. Refer to the website for compatible lenses.
- In [Miniature Effect] of Creative Control Mode, Defocus Control cannot be used.

Recording images by changing the brightness or color tone (Intelligent Auto Plus Mode)

Recording Mode:

This mode enables you to change the brightness and color tone to your preferred settings from the ones set by the camera in Intelligent Auto Mode.



1 Press [MENU/SET] when in Intelligent Auto Mode.

2 Press ► to select [] and then press [MENU/SET].



- Press [DISP.] or touch [DISP.] to display the description of the selected mode.
- When the menu does not appear, select the [] tab on the menu screen.

Setting brightness

1 **Press [].**

2 **Rotate the rear dial to adjust brightness.**

- Press [] again to return to the recording screen.



Setting color

1 Press [WB].

2 Rotate the rear dial to adjust color.

- This will adjust the color of the image from a reddish color to a bluish color.
- Press [WB] again to return to the recording screen.



■ Change the settings by using the touch panel

❶ Touch [].

❷ Touch the item you want to set.

[]: Color tone

[]: Defocus level

[]: Brightness



❸ Drag the slide bar to set.

- If you press [MENU/SET], you can return to the recording screen. (To end the Defocus Control function, press [Fn4].)

- The brightness and color settings will return to the default (center point) when this unit is turned off or the camera is switched to another Recording Mode.

Registering your preferred settings (Custom Mode)

Recording Mode: C1 C2 C3

You can register the current camera settings as custom settings. If you then record in Custom Mode, you can use the registered settings.
• Initial setting of the Program AE Mode is registered as the custom settings initially.

Registering Personal Menu Settings (Registering custom settings)

To allow recording using the same settings, up to 5 sets of current camera settings can be registered using [Cust.Set Mem.].

Preparations: Set in advance the Recording Mode you wish to save and select the desired menu settings on the camera.

1 **Select [Cust.Set Mem.] in the [Custom] menu.** (P37)

2 **Press ▲/▼ to select the custom set to register and then press [MENU/SET].**

• Confirmation screen is displayed. It is executed when [Yes] is selected.
Exit the menu after it is executed.

Custom set	Description of settings
C1	The settings are registered for C1 on the mode dial.
C2	The settings are registered for C2 on the mode dial.
C3-1	The settings are registered for C3 on the mode dial. • You can register up to 3 sets of custom settings and use the different sets as condition demand.
C3-2	
C3-3	

Recording using registered custom set

You can easily call up the settings you have registered using [Cust.Set Mem.].

1 Set the mode dial to [C1], [C2] or [C3].

- If you set the mode dial to [C3], the camera calls a custom setting registered to [C3-1], [C3-2] or [C3-3]. The last custom setting you used is called.
 To change the custom setting
 → step **2**, **3**

2 Press [MENU/SET] to display the menu.

3 Press ◄/► to select the custom setting you want to use, and then press [MENU/SET].

- Saving of the selected custom settings is displayed on the screen.

Ⓐ Custom settings display



■ Changing the settings

Registered contents do not change when the menu setting is changed temporarily with the mode dial set to C1, C2 or C3. To change the registered settings, overwrite the registered content using [Cust.Set Mem.] on the [Custom] menu.

- The following menu settings are not registered in the custom set since they are reflected to other Recording modes.

[Rec] menu	[Setup] menu	[Custom] menu
• Data registered with [Face Recog.] • The [Profile Setup] setting	• All menus	• [Touch Scroll] • [Menu Guide]

Optical Image Stabilizer

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

Using one of these modes, jitter during picture taking is detected, and the camera automatically compensates the jitter, enabling jitter-free images to be taken.

A lens which supports the stabilizer function is required.
– The interchangeable lens (H-HS12035, H-VS014140) supports the stabilizer function.

• The interchangeable lens (H-HS12035, H-VS014140) have O.I.S switch. Stabilizer function is activated when the O.I.S switch of the lens is set to [ON]. ([]) is set at the time of purchase)

■ Setting the Stabilizer in the [Rec] menu

1 **Select [Stabilizer] in the [Rec] menu.** (P37)

2 **Press ▲/▼ to select the item and then press [MENU/SET].**

Item	Settings
[] ([Normal])	Vertical and horizontal shake are compensated for.
[] ([Panning])	Camera shake is corrected for up/down movements. This mode is ideal for panning (a method of taking pictures which involves turning the camera to track the movements of a subject which continues to move in a fixed direction).
[OFF]	[Stabilizer] does not work. (This can be selected only when using a lens without the [O.I.S.] switch.)

• The [Stabilizer] feature is only available if the lens you are using has an internal stabilizer.
• Exit the menu after it is set.

■ Preventing jitter (camera shake)

When the jitter alert [] appears, use [Stabilizer] (P171), a tripod, the self-timer (P157) or the remote shutter (DMW-RSL1: optional) (P268).

• Shutter speed will be slower particularly in the following cases. Keep the camera still from the moment the shutter button is pressed until the picture appears on the screen. We recommend using a tripod.
– Slow Sync.
– Slow Sync./Red-Eye Reduction
– [Clear Nightscape]/[Cool Night Sky]/[Warm Glowing Nightscape]/[Artistic Nightscape]/[Glittering Illuminations]/[Clear Night Portrait] (Scene Guide Mode)
– When you set to a slow shutter speed

- It is recommended to disable the Optical Image Stabilizer when using a tripod. [OFF] is displayed on the screen at that time.
- The stabilizer function may not be effective in the following cases. Be careful of camera jitter when you press the shutter button.
 - When there is a lot of jitter.
 - When the zoom magnification is high.
 - When using the Digital Zoom.
 - When taking pictures while following a moving subject.
 - When the shutter speed becomes slower to take pictures indoors or in dark places.
- The panning effect in [] is more difficult to achieve in the following cases.
 - In brightly lit places such as in broad daylight on a summer's day.
 - When the shutter speed is faster than 1/100th of a second.
 - When you move the camera too slowly because the subject is moving slowly. (The background will not become a blur.)
 - When the camera does not keep up with the subject satisfactorily
- We recommend taking pictures with the viewfinder when panning in [].

Taking Pictures with the Zoom

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

Types of zooms and recording magnification

Feature	Optical Zoom	Extended Tele Conversion (EX)	Digital Zoom
Recording magnification	Different depending on the lens used.	When taking still pictures: Max. 2×*1 When recording motion pictures: 2.4×*2	When selecting [2×] When selecting [4×]
Picture quality	No deterioration	No deterioration	The higher the magnification level, the greater the deterioration.
Conditions	None	when taking still pictures: Refer to P120 when recording motion pictures: Set [Ex. Tele Conv.] to [ON].	Set the [Digital Zoom] to [2×] or [4×] in the [Rec]/[Motion Picture] menu.

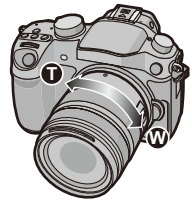
*1 When a picture size of [S] (4 M), aspect ratio of [4:3] is selected.
The magnification level differs depending on [Picture Size] and [Aspect Ratio] setting.

*2 When recording quality setting [FHD/30p], [FHD/24p], [FHD/30p/] or [FHD/24p/] is selected:
When [HD/30p] is selected, Extended Tele Conversion factor will change to 3.6×.
When [VGA/30p] is selected, Extended Tele Conversion factor will change to 4.8×.
Pictures cannot be enlarged by using Extended Tele Conversion in the following conditions (1×).
- When [FHD/60p], [FHD/60i], [HD/60p/] is set.
- When [Frame Rate] is set to [40%] or [48%].
- [Toy Effect] (Creative Control Mode)

- When using the Digital Zoom, we recommend using a tripod and the self-timer (P157) for taking pictures.
- [Digital Zoom] cannot be used in the following cases:
 – Intelligent Auto Mode (iA or iA+)
 – Scene Guide Mode
 – [Toy Effect]/[Miniature Effect] (Creative Control Mode)
 – [Multi Exp.]

Optical Zoom

You can zoom-out to record landscapes etc. in wide angle (Wide) or zoom-in to make people and objects appear closer (Tele) by rotating the zoom ring.



Rotate to T side:
Enlarges distant subject
Rotate to W side:
Widens angle of view

Using the Extended Tele Conversion when taking pictures

Using [Ex. Tele Conv.] in the recording menu, you can take magnified pictures without deteriorating the picture quality.
• When using [Ex. Tele Conv.], set the picture size to [M] or [S] (picture sizes indicated with EX).

Item	Description of settings
[ZOOM]	With the operations below, you can manually zoom in to the maximum magnification of the Extended Tele Conversion. ❶ Press one of the function buttons. • Press the function button to which you have assigned [Zoom Control] in [Fn Button Set] (P42). ❷ Press ◄/► or ▲/▼. ◄/►: Zoom slow ▲/▼: Zoom fast • If you press the function button again or wait for a fixed amount of time to pass, the zoom operation will be terminated. • When an interchangeable lens supporting power zoom (electrically operated zoom) is in use and [Step Zoom] (P61) is set to [ON], the step zoom operation will be assigned to the front dial, rear dial, or control dial.
[TELE CONV.]	Automatically zooms in to the maximum magnification of the Extended Tele Conversion.
[OFF]	—

Screen display (When set to [ZOOM])

Ⓐ Optical Zoom range (Focal length)*
Ⓑ Extended Tele Conversion range for still picture recording (Zoom magnification)



* This zoom slider is displayed when using an interchangeable lens that supports the power zoom.

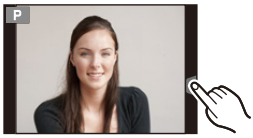
- When an interchangeable lens supporting power zoom is in use and [ZOOM] is set, the zoom enters the Extended Tele conversion area after reaching the T-end of the optical zoom area.
- The indicated zoom magnification is an approximation.

- When the Extended Tele Conversion is used, angle of view for still pictures will be different from the angle of view for motion pictures because the zoom factor is different between them. Angle of view for recording can be checked beforehand by matching the [Rec Area] (P59) setting to the mode you wish to record in.
- Extended Tele Conversion is not available in the following cases.
 – [Toy Effect] (Creative Control Mode)
 – When [Quality] is set to [RAW], [RAW] or [RAW]
 – When [Burst Rate] is set to [SH]
 – When [HDR] is set to [ON]
 – [Multi Exp.]

Zooming using touch operations

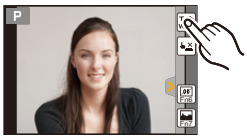
You can perform zoom operations by touching. (Touch zoom)
(Optical Zoom and Extended Tele Conversion for still picture recoding are operable)
• If you are using an interchangeable lens not supporting power zoom (H-HS12035, H-VS014140), you can only operate the Extended Tele Conversion for pictures by setting [Ex. Tele Conv.] (P120) to [ZOOM].

1 **Touch [].**



2 **Touch [].**

• The slide bar is displayed.



3 **Perform zoom operations by dragging the slide bar.**

• The zoom speed varies depending on the touched position.

[▲]/[▼]	Zooms slowly
[▲▲]/[▼▼]	Zooms quickly

• Touch [] again to end touch zoom operations.



• When [Step Zoom] (P61) is set to [ON], the slide bar for step zoom is displayed.



Taking pictures by using the flash

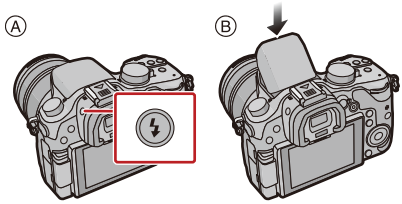
Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

Open/Close the built-in flash

Taking a picture using the flash becomes possible by opening the built-in flash.

Ⓐ To open the built-in flash
Turn the camera on, and press the flash open button.

Ⓑ To close the built-in flash
Press the built-in flash until it clicks.



- Forcibly closing the flash can damage the camera.
- Be sure to close the built-in flash when not in use.

- The built-in flash does not open automatically.
- **Be careful not to catch a finger when closing the built-in flash.**

The available flash range

If the distance to the subject is close when taking a picture using a flash, part of the recorded image becomes dark because the light of flash is blocked by the lens or it becomes out of flash range. Check the distance to the subject when taking a picture. The distance at which light from the flash is blocked by lens, and the distance to which light from the flash is delivered vary depending on the lens used.

	When the interchangeable lens (H-HS12035) is used		When the interchangeable lens (H-VS014140) is used	
	Available flash range		Available flash range	
	Wide	Tele	Wide	Tele
[AUTO] in [Sensitivity]	30 cm (0.98 feet) to 17.1 m (56.0 feet)	30 cm (0.98 feet) to 17.1 m (56.0 feet)	50 cm (1.6 feet) to 12.0 m (39.0 feet)	50 cm (1.6 feet) to 8.2 m (27.0 feet)

- The available flash range is an approximation.
- This is the range when ISO Limit Set (P134) is set to [OFF].

- When recording with the flash, white saturation can occur if the subject is too close. If [Highlight] of the [Custom] menu is set to [ON], regions of white saturation will blink black and white when you play back or use Auto Review. In this case, we recommend that you adjust [Flash Adjust.] (P133) in the minus direction and record the pictures again.
- Do not bring the flash too close to objects or close the flash while it is activated. The objects may be discolored by its heat or lighting.
- Do not close the flash soon after the flash is activated prior to taking pictures due to Forced ON/ Red-Eye Reduction etc. It causes a malfunction.
- Recording a subject from too close, or without sufficient flash will not provide the appropriate level of exposure, and may result in a picture that is too white or dark.
- You must wait a moment to take the next picture while the flash icon is blinking RED indicating the flash is charging.
- If recording a subject without sufficient flash, the White Balance may not be properly adjusted.
- **When you use certain lenses, light from the flash may be blocked or fail to cover the lens field of view, causing dark areas to appear in the resulting pictures.**
- When taking pictures with flash with the lens hood attached, the lower portion of the photo may turn dark and the control of the flash may be disabled because the photo flash may be obscured by the lens hood. We recommend detaching the lens hood.
- It may take time to charge the Flash if you repeatedly take pictures. Take a picture after the access indication disappears.
- The Red-Eye Reduction effect differs between people. Also, if the subject was far away from the camera or was not looking at the first flash, the effect may not be evident.
- When you attach an external flash, it takes priority over the built-in flash. Refer to P265 for the external flash.

Changing Flash Mode

Applicable modes: P A S M C1 C2 C3

Set the built-in flash to match the recording.
• Open the flash.

1 **Select [Flash] in the [Rec] menu.** (P37)
2 **Press ▲/▼ to select [Flash Mode] and then press [MENU/SET].**
3 **Press ▲/▼ to select the item and then press [MENU/SET].**

Item	Description of settings
([Forced Flash On]) / ([Forced On/ Red-Eye])*1	The flash is activated every time regardless of the recording conditions. • **Use this when your subject is back-lit or under fluorescent light.**
([Slow Sync.]) / ([Slow Sync./ Red-Eye])*1	When taking pictures against a dark background landscape, this feature will slow the shutter speed when the flash is activated. Dark background landscape will appear brighter. • **Use this when you take pictures of people in front of a dark background.** • **Using a slower speed can cause motion blur. Using a tripod can enhance your photos.**
([Forced Flash Off])	The flash is not activated in any recording conditions. • **Use this when you take pictures in places where the use of flash is not permitted.** • **Close the flash to turn it off when the built-in flash is used.**

*1 You can adjust the flash output only when [Firing Mode] in [Flash] is set to [TTL].

The flash is activated twice. The interval between the first and second flash is longer when [] or [] is set. The subject should not move until the second flash is activated.

■ Shutter speed for each flash setting

Flash setting	Shutter speed (Sec.)
	1/60*2 to 1/160th

Flash setting	Shutter speed (Sec.)
	1 to 1/4000th
	60*3 to 1/4000th

*2 This becomes 60 seconds in Shutter-Priority AE Mode and B (Bulb) in the Manual Exposure Mode.
*3 This becomes B (Bulb) in the Manual Exposure Mode.
• When the flash is activated the fastest shutter speed that can be selected is 1/160 of a second.
• In Intelligent Auto (or) Mode, shutter speed changes depending on the identified scene.

■ Available flash settings by Recording Mode

The available flash settings depend on the Recording Mode.
(○: Available, —: Not available, ●: Initial setting of Scene Guide Mode)

iA	Intelligent Auto Mode	—*	—*	—*	—*	○
iA+	Intelligent Auto Plus Mode	—*	—*	—*	—*	○
P	Program AE Mode	○	○	○	○	○
A	Aperture-Priority AE Mode	○	○	○	○	○
S	Shutter-Priority AE Mode	○	○	—	—	○
M	Manual Exposure Mode	○	○	—	—	○
M	Creative Video Mode	—	—	—	—	○
	Creative Control Mode	—	—	—	—	○
SCN Scene Guide Mode	[Clear Portrait]	○	●	—	—	○
	[Silky Skin]	○	●	—	—	○
	[Backlit Softness]	—	—	—	—	●
	[Clear in Backlight]	●	—	—	—	○
	[Relaxing Tone]	—	—	—	—	●
	[Sweet Child's Face]	○	●	—	—	○
	[Distinct Scenery]	—	—	—	—	●
	[Bright Blue Sky]	—	—	—	—	●
	[Romantic Sunset Glow]	—	—	—	—	●
	[Vivid Sunset Glow]	—	—	—	—	●
	[Glistening Water]	—	—	—	—	●
	[Clear Nightscape]	—	—	—	—	●
	[Cool Night Sky]	—	—	—	—	●
	[Warm Glowing Nightscape]	—	—	—	—	●
	[Artistic Nightscape]	—	—	—	—	●
	[Glittering Illuminations]	—	—	—	—	●
	[Clear Night Portrait]	—	—	—	●	○
	[Soft Image of a Flower]	●	—	—	—	○
	[Appetizing Food]	●	—	—	—	○
	[Cute Dessert]	●	—	—	—	○
	[Freeze Animal Motion]	●	—	—	—	○
	[Clear Sports Shot]	●	—	—	—	○
	[Monochrome]	●	○	○	○	○





∗ Cannot be set using the [Rec] menu. [ᵢ⚡ᴬ] is set when the flash is opened. (P111)
- The flash setting may change if the Recording Mode is changed. Set the flash setting again if necessary.
- The flash setting is memorized even if the camera is turned off. When changing scene using Scene Guide Mode, the Scene Guide Mode flash setting is returned to the default value with each change of scene.
- Flash will not be activated when recording motion picture.

Setting to the 2nd Curtain Synchro

Applicable modes: P A S M C1 C2 C3

2nd curtain synchro activates the flash just before the shutter closes when taking pictures of moving objects such as cars using a slow shutter speed.

1. **Select [Flash] in the [Rec] menu.** (P37)
2. **Press ▲/▼ to select [Flash Synchro] and then press [MENU/SET].**
3. **Press ▲/▼ to select an item and then press [MENU/SET].**

Item	Description of settings	
[1ST]	1st curtain synchro The normal method when taking pictures with the flash.	
[2ND]	2nd curtain synchro The light source appears behind the subject and picture becomes dynamic.	

- Set it to [1ST] for normal use.
- [2nd] is displayed in the flash icon on the screen if you set [Flash Synchro] to [2ND].
- Only available when [Firing Mode] in [Flash] is set to [TTL] or [MANUAL]. (P129)
- The [Flash Synchro] settings also apply to an external flash. (except the wireless flash) (P265)
- When a fast shutter speed is set, the effect of [Flash Synchro] may deteriorate.
- You cannot set [⚡👁] or [⚡S👁] when [Flash Synchro] is set to [2ND].

Adjust the flash output

Applicable modes: P A S M C1 C2 C3 SCN

Adjust the flash brightness when pictures taken with the flash are over or underexposed.

1. **Select [Flash] in the [Rec] menu.** (P37)
2. **Press ▲/▼ to select [Flash Adjust.] and then press [MENU/SET].**
3. **Press ◄/► to set the flash output and then press [MENU/SET].**
 - You can adjust from [−3 EV] to [+3 EV] in steps of [1/3 EV].
 - Select [±0] to return to the original flash output.

- [+] or [−] is displayed on the flash icon in the screen when the flash level is adjusted.
- It can be set only when [Firing Mode] in [Flash] is set to [TTL]. (P129)
- You can also adjust the flash output by pressing [] and rotating the front dial. (P133)
- The [Flash Adjust.] setting also applies to an external flash. (excluding the wireless flash) (P265)

Synchronising the output of the built-in flash to the Exposure Compensation

Applicable modes: P A S M C1 C2 C3 SCN

When [Auto Exposure Comp.] in [Flash] in the [Rec] menu is set to [ON], the brightness of the built-in flash will automatically be set to the level appropriate to the selected Exposure Compensation.

- For details on Exposure Compensation, see P133.
- The [Auto Exposure Comp.] setting also applies to an external flash. (P265)

Changing the firing mode (Manual flash/wireless flash)

Applicable modes: P A S M C1 C2 C3

You can set a flash type at [Firing Mode] in [Flash].

Item	Description of settings
[TTL]	The camera automatically sets the flash output.
[MANUAL]	Set the luminosity ratio of the flash manually. In [TTL] you can shoot the photograph you want even when shooting dark scenes that may otherwise be too brightly lit by the flash.
[WIRELESS]	Set when using an external flash with a wireless connection (optional).

- When [MANUAL] is set, the luminosity ratio ([1/1], etc.) is displayed on the flash icon on the screen.
- When [WIRELESS] is set, [WL] is displayed on the flash icon on the screen.

Setting the luminosity ratio (When [MANUAL] is selected)

1. **Select [Flash] in the [Rec] menu.** (P37)
2. **Press ▲/▼ to select [Manual Flash Adjust.] and then press [MENU/SET].**
3. **Press ◄/► to select an item and then press [MENU/SET].**
 - You can set from [1/1] (full brightness) to [1/128] in steps of [1/3].

Setting the wireless flash (When [WIRELESS] is selected)

You can separately control flash-firings of the built-in flash and each flash in three groups by using the flash that supports the wireless control (DMW-FL360L: optional).

Preparations: Open the flash of this unit by pressing flash open button.

1 **Configure the external flash setting to RC mode, and then place the external flash.**
- Set the channel and group of the external flash.

2 **Select [Flash] on the [Rec] menu.** (P37)

3 **Press ▲/▼ to select [Wireless Channel], [Wireless FP], [Communication Light] or [Wireless Setup] and then press [MENU/SET].**

4 **Press ▲/▼ to select the item and then press [MENU/SET].**

[Wireless Channel]
Select the channel that corresponds to the channel of the external flash you want to control.
Settings: [1CH]/[2CH]/[3CH]/[4CH]

[Wireless FP]
During wireless recording, an external flash fires an FP flash (high speed repetition of flash firing). This firing allows recording with the flash at a fast shutter speed.
Settings: [ON]/[OFF]

[Communication Light]
Set the communication light level of the built-in flash for wireless recording.
Settings: [HIGH]/[STANDARD]/[LOW]

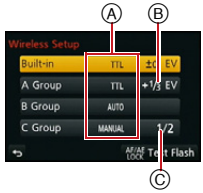
[Wireless Setup]

• Press the [AF/AE Lock] button to fire a test-flash.

Ⓐ Firing Mode

Ⓑ Flash output

Ⓒ Luminosity ratio

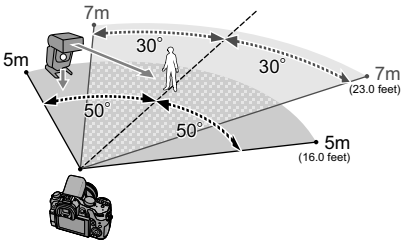


Item	Description of settings
[Built-in]＊	**[Firing Mode]** [TTL]: The camera automatically sets the output of the built-in flash. [OFF]: The built-in flash fires only a signal-flash.
	[Flash Adjust.] The output of the built-in flash is set manually.
[A Group]/ [B Group]/ [C Group]	**[Firing Mode]** [TTL]: The camera automatically sets the output of the external flash. [AUTO]＊: Flash output is set by the external flash. [MANUAL]: Set the luminosity ratio of the external flash manually. [OFF]: The external flashes in the specified group will not fire.
	[Flash Adjust.] Set the output of the external flash manually when [Firing Mode] is set to [TTL].
	[Manual Flash Adjust.] Set the luminosity ratio of the external flash when [Firing Mode] is set to [MANUAL]. • You can set from [1/1] (full brightness) to [1/128] in steps of [1/3].

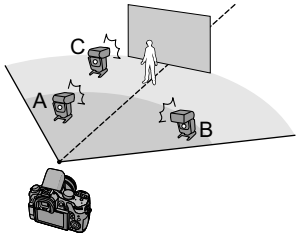
＊ Not available when [Wireless FP] is set to [ON].

Controllable range of the wireless flash

Place the wireless flash with its wireless sensor facing toward the camera. Estimated controllable range is shown in the following figure. Controllable range differs depending on the surrounding environment.



Placement example



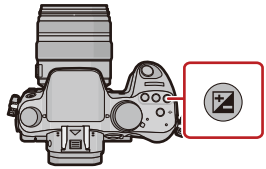
- The recommended number of wireless flashes for each group is three or less.
- If the subject is too close to the camera, signal flashing may affect the exposure. (The effect can be reduced by lowering the output of the built-in flash with a diffuser, etc.)

Compensating the Exposure

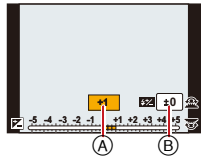
Applicable modes: P A S C1 C2 C3 SCN

Use this function when you cannot achieve appropriate exposure due to the difference in brightness between the subject and the background.

1 Press [].



2 Rotate the rear dial to compensate the exposure.



Ⓐ Exposure Compensation value
Ⓑ Flash Adjust

- You can switch the functions between the rear dial and the front dial by pressing [DISP.].
- The Exposure Compensation value can be set within a range of −5 EV to +5 EV. When recording motion pictures, the Exposure Compensation value can be set within a range of −3 EV to +3 EV.
- Select [±0] to return to the original exposure.

3 Rotate the front dial to adjust the flash output.

- Only available when [Auto Exposure Comp.] (P128) in [Flash] in the [Rec] menu is set to [ON], and [Firing Mode] (P129) in [Flash] is set to [TTL] or [WIRELESS].
- Flash brightness can also be adjusted using [Flash Adjust.] in [Flash] in the [Rec] Menu. (P128)

4 Press [] to set.

- You can also press the shutter button halfway to set.

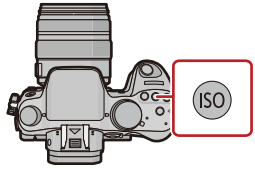
- When [Auto Exposure Comp.] in [Flash] in the [Rec] menu is set to [ON], the brightness of the built-in flash will automatically be set to the level appropriate to the selected Exposure Compensation. (P128)
- When the exposure value is out of the −3 EV to +3 EV range, the brightness of the recording screen will no longer change. It is recommended to record by checking the actual brightness of the recorded image in the Auto Review or playback screen.
- The set exposure value is memorized even if the camera is turned off.
- The compensation range of the exposure will be limited depending on the brightness of the subject.

Setting the Light Sensitivity

Applicable modes: P A S M C1 C2 C3

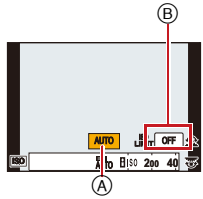
This allows the sensitivity to light (ISO sensitivity) to be set. Setting to a higher figure enables pictures to be taken even in dark places without the resulting pictures coming out dark.

1 **Press [ISO].**



2 **Rotate the rear dial to select the ISO sensitivity.**

Ⓐ ISO sensitivity
Ⓑ ISO Limit Set
- You can switch the functions between the rear dial and the front dial by pressing [DISP.].



3 **Rotate the front dial to set the upper limit of ISO sensitivity.**

- It will work when the [Sensitivity] is set to [AUTO] or [ISO].

4 **Press [ISO] to set.**

- You can also set by pressing the shutter button halfway.

ISO sensitivity	Settings
AUTO	The ISO sensitivity is automatically adjusted according to the brightness. • Maximum [ISO3200] (With the flash on [ISO1600])*1
iISO **(Intelligent)**	The ISO sensitivity is adjusted according to the movement of the subject and the brightness. • Maximum [ISO3200] (With the flash on [ISO1600])*1 • The shutter speed is not fixed when the shutter button is pressed halfway. It is continuously changing to match the movement of the subject until the shutter button is pressed fully.
L.125*2/200/400/800/1600/3200/6400/12800/H.25600*2	The ISO sensitivity is fixed to various settings. • When the [ISO Increments] in [Rec] menu (P169) is set to [1/3 EV], items of ISO sensitivity that can be set will increase.

*1 When [ISO Limit Set] is set to [OFF].
When [ISO Limit Set] is set to [400], [800], [1600], [3200], [6400] or [12800], the camera optimizes the ISO sensitivity according to the brightness of the subject within the range not exceeding the selected upper limit.
*2 Only available when [Extended ISO] is set.

	200 ⟷ 12800	
Recording location (recommended)	When it is light (outdoors)	When it is dark
Shutter speed	Slow	Fast
Noise	Less	Increased
Jitter of the subject	Increased	Less

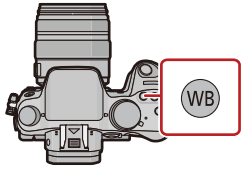
- For the focus range of flash when [AUTO] is set, refer to P123.
- When [Electronic Shutter] is set to [ON], the ISO sensitivity can be set up to [ISO 1600].
- Setting items below will be selectable in Creative Video Mode.
 [AUTO]/[200] to [6400]
- [ISO Limit Set] does not work in the following conditions.
 – [Clear Nightscape]/[Cool Night Sky]/[Warm Glowing Nightscape] (Scene Guide Mode)
 – When recording motion pictures

Adjusting the White Balance

Applicable modes: P A S M C1 C2 C3 SCN

In sunlight, under incandescent lights or in other such conditions where the color of white takes on a reddish or bluish tinge, this item adjusts to the color of white which is closest to what is seen by the eye in accordance with the light source.

1 **Press [WB].**



2 **Rotate the rear dial or front dial to select the White Balance.**

- Setting can also be performed by rotating the control dial.



3 **Press ▼, and then press ◄/► or ▲/▼ to make fine adjustments to the White Balance.**

◄ : A (AMBER: ORANGE)
► : B (BLUE: BLUISH)
▲ : G (GREEN: GREENISH)
▼ : M (MAGENTA: REDDISH)

- You can also make fine adjustments by touching the White Balance graph.
- To reset, press [DISP.].

4 Press [WB] to set.

• You can also press the shutter button halfway to set.

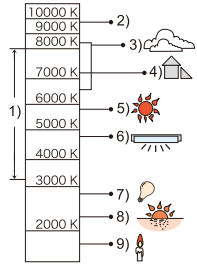
Item	Recording conditions
[AWB]	Automatic adjustment
[☼]	When taking pictures outdoors under a clear sky
[☁]	When taking pictures outdoors under a cloudy sky
[⌂]	When taking pictures outdoors in the shade
[☼]	When taking pictures under incandescent lights
[WB]*	When taking pictures with the flash only
[1]/[2]/[3]/[4]	The manually set value is used
[K]	When using the preset color temperature setting

*It will operate as [AWB] during motion picture recording.

■ Auto White Balance

Depending on the conditions prevailing when pictures are taken, the pictures may take on a reddish or bluish tinge. Furthermore, when a multiple number of light sources are being used or there is nothing with a color close to white, Auto White Balance may not function properly. In a case like this, set the White Balance to a mode other than [AWB].

1 Auto White Balance will work within this range.
2 Blue sky
3 Cloudy sky (Rain)
4 Shade
5 Sunlight
6 White fluorescent light
7 Incandescent light bulb
8 Sunrise and sunset
9 Candlelight
K=Kelvin Color Temperature



Finely adjusting the White Balance

You can finely adjust the White Balance when you cannot acquire the desired hue by setting the White Balance.

- If you finely adjust the White Balance to [A] (amber), the White Balance icon on the screen will change to orange. If you finely adjust the White Balance to [B] (blue), the White Balance icon on the screen will change to blue.
- If you finely adjust the White Balance to [G] (green) or [M] (magenta), [+] (green) or [−] (magenta) appears beside the White Balance icon on the screen.
- The White Balance fine adjustment setting is reflected in the picture when using the flash.
- You can finely adjust the White Balance independently for each White Balance item.
- The White Balance fine adjustment setting is memorized even if the camera is turned off.
- The White Balance fine adjustment level returns to the standard setting (center point) in the following cases.
 – When you reset the White Balance in [1], [2], [3] or [4]
 – When you reset the color temperature manually in [K]

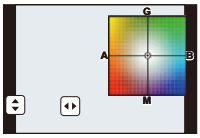
- Under fluorescent lighting, LED lighting fixture etc., the appropriate White Balance will vary depending on the lighting type, so use [AWB] or [1], [2], [3], [4].
- The White Balance is only calculated for subjects within the range of the camera's flash. (P123)
- The set White Balance is maintained even after this unit is turned off, but when the White Balance is changed in a different Scene Guide Mode, [White Balance] for the Scene Guide Mode that was set will return to [AWB].
- In the Scene Guide Modes listed below, White Balance is fixed to [AWB].
 – [Backlit Softness]/[Relaxing Tone]/[Distinct Scenery]/[Bright Blue Sky]/[Romantic Sunset Glow]/[Vivid Sunset Glow]/[Glistening Water]/[Clear Nightscape]/[Cool Night Sky]/[Warm Glowing Nightscape]/[Artistic Nightscape]/[Glittering Illuminations]/[Clear Night Portrait]/[Appetizing Food]/[Cute Dessert]

White Balance Bracket

Bracket setting is performed based on the adjustment values for the White Balance fine adjustment, and 3 pictures with different colors are automatically recorded when the shutter button is pressed once.

1. **Press [WB].**
2. **Rotate the rear dial or front dial to select the White Balance, and then press ▼.**
3. **Rotate the control dial to set the bracket.**

 Rotating the control dial to the right: Horizontal ([A] to [B])
 Rotating the control dial to the left: Vertical ([G] to [M])

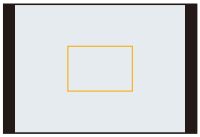
 - You can also set the bracket by touching [▲▼]/[◀▶].
 - To reset, press [DISP.].
4. **Press [MENU/SET].**

- [BKT] is displayed in White Balance icon in the screen when the White Balance Bracket is set.
- The White Balance Bracket setting is released when this unit has been turned off (including Sleep Mode).
- You will only hear the shutter sound once.
- The White Balance Bracket does not work in the following cases:
 - When recording motion pictures
 - When [Quality] is set to [RAW], [RAW] or [RAW]
 - When [HDR] is set to [ON]
 - [Multi Exp.]
 - When using [Time Lapse Shot]

Setting the White Balance manually

Set the White Balance value. Use to match the condition when taking photographs.

1. **Press [WB].**
2. **Rotate the rear dial or front dial to select [1], [2], [3], or [4], and then press ▲.**
3. **Aim the camera at a sheet of white paper etc. so that the frame in the center is filled by the white object only and then press [MENU/SET].**

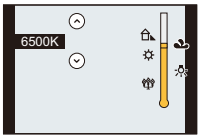


• White Balance may not be set when the subject is too bright or too dark. Set the White Balance again after adjusting to appropriate brightness.

Setting the color temperature

You can set the color temperature manually for taking natural pictures in different lighting conditions. The color of light is measured as a number in degrees Kelvin. As the color temperature increases, the picture becomes more bluish. As the color temperature decreases, the picture becomes more reddish.

1. **Press [WB].**
2. **Rotate the rear or front dial to select [K], and then press ▲.**
3. **Press ▲/▼ to select the color temperature and then press [MENU/SET].**
 • You can set a color temperature from [2500K] to [10000K].

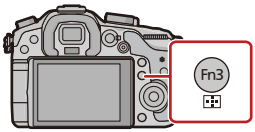


Taking Pictures with Auto Focus

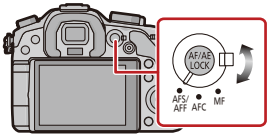
Applicable modes: P A S M C1 C2 C3

This allows the focusing method that suits the positions and number of the subjects to be selected.
Also, it is possible to set the focus to the subject specified on the touch screen.
(Set the [Touch AF] of the [Touch Settings] in the [Custom] menu to [ON].)

[]/[Fn3] button can be used in two ways, as [] (AF Mode) or as [Fn3] (function 3). At the time of purchase, it is initially set to [AF Mode].
• Refer to P42 for details about the function button.

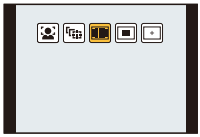


1 **Set the focus mode lever to [AFS/AFF] or [AFC] (P142).**



2 **Press [].**

3 **Press ◄/► to select AF Mode and then press [MENU/SET].**



• AF area selection screen is displayed when ▼ is pressed while [], [], [], or [] is selected. For operation in the AF area selection screen, refer to P146.

• It cannot be set to [] in the following conditions.
– [Clear Nightscape]/[Cool Night Sky]/[Warm Glowing Nightscape]/[Artistic Nightscape]/[Glittering Illuminations]/[Appetizing Food]/[Cute Dessert] (Scene Guide Mode)
• The [] is disabled in the following cases.
– [AFF]/[AFC] ([Focus Mode])
• The AF Mode is fixed to [] in the following cases.
– When using the Digital Zoom
– [Miniature Effect] (Creative Control Mode)

About the focus mode (AFS/AFF/AFC)

Item	The movement of the subject and the scene (recommended)	Description of settings
AFS✳	Subject is still (Scenery, anniversary photograph, etc.)	“AFS” is an abbreviation of “Auto Focus Single”. Focus is set automatically when the shutter button is pressed halfway. Focus will be fixed while it is pressed halfway.
AFF✳	Movement cannot be predicted (Children, pets, etc.)	“AFF” is an abbreviation of “Auto Focus Flexible”. In this mode, focusing is performed automatically when the shutter button is pressed halfway. If the subject moves while the shutter button is pressed halfway, the focus is corrected to match the movement automatically.
AFC	Subject is moving (Sport, trains, etc.)	“AFC” is an abbreviation of “Auto Focus Continuous”. In this mode, while the shutter button is pressed halfway, focusing is constantly performed to match the movement of the subject. When the subject is moving, the focusing is performed by predicting the subject position at the time of recording. (Movement prediction)
MF	Set the focus manually. (P148)	

✳ In [AFS/AFF] (P54) of the [Custom] menu, you can assign [AFS] or [AFF] to the [AFS/AFF] of the focus mode lever.

- **When recording using [AFF], [AFC]**
 - It may take time to focus on the subject when you operate the zoom from Wide to Tele or suddenly change the subject from a distant one to a nearby one.
 - Press the shutter button halfway again when it is difficult to focus on the subject.
 - While the shutter button is pressed halfway, shake may be seen on the screen.
- Depending on the lens used, [AFF] and [AFC] may not operate. Refer to the website on P19.

Type of the Auto Focus Mode

About [👤] ([Face Detection])



The camera automatically detects the person's face. The focus and exposure can then be adjusted to fit that face no matter what portion of the picture it is in. (max. 15 areas)
When the camera detects a person's face, the AF area is displayed.
Yellow:
When the shutter button is pressed halfway, the frame turns green when the camera is focused.
White:
Displayed when more than one face is detected. Other faces that are the same distance away as faces within the yellow AF areas are also focused.

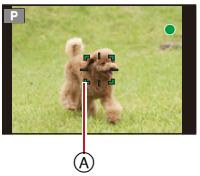
- **Position and size of the AF area can be changed.** **(P146)**
- When [👤] is selected and [Metering Mode] is set to multiple [◎], the camera will adjust the exposure to suit the person's face. (P162)
- Under certain picture-taking conditions including the following cases, the Face Detection Function may fail to work, making it impossible to detect faces. The AF Mode is switched to [▦].
 - When the face is not facing the camera
 - When the face is at an angle
 - When the face is extremely bright or dark
 - When the facial features are hidden behind sunglasses, etc.
 - When the face appears small on the screen
 - When there is little contrast on the faces
 - When there is rapid movement
 - When the subject is other than a human being
 - When the camera is shaking

Setting up [AF Tracking] ([AF Tracking])

Focus and exposure can be adjusted to a specified subject. Focus and exposure will keep on following the subject even if it moves. (Dynamic tracking)

When operating buttons

Place the subject in the AF tracking frame, and press the shutter button halfway to lock the subject.



Ⓐ AF tracking frame

- AF area will turn green when the camera detects the subject.
- The AF area turns yellow when the shutter button is released.
- Lock is canceled when [MENU/SET] is pressed.
- Tracking AF and Face Detection will switch every time [] is pressed in the Intelligent Auto (or) Mode.

When operating the touch screen

You can lock the subject by touching it.

- Perform the operation after canceling the touch shutter function.
- The AF area turns yellow while the subject is locked.
- Lock is canceled when [] is touched.



- Exposure is adjusted in accordance with the locked subject when [Metering Mode] is set to []. (P162)
- If it fails to lock, AF area will flash in red, and disappear. Try to lock again.
- AF Tracking may be disabled in certain picture conditions such as when it is very dark. AF Mode will be switched to [] in that case.
- In the following cases, [] operates as []
 - [Glistening Water]/[Glittering Illuminations]/[Soft Image of a Flower]/[Monochrome] (Scene Guide Mode)
 - [Sepia]/[Dynamic Monochrome]/[Soft Focus]/[Star Filter] (Creative Control Mode)
 - When [Photo Style] is set to [Monochrome]
 - When using [Time Lapse Shot]
- Dynamic Tracking function may not work in the following cases:
 - When the subject is too small
 - When the recording location is too dark or bright
 - When the subject is moving too fast
 - When the background has the same or similar color to the subject
 - When jitter is occurring
 - When zoom is operated

About [▦] ([23-Area])

Up to 23 points for each AF area can be focused. This is effective when the subject is not in the center of the screen.
(AF area frame will be same as image aspect ratio setting)

- **The 23 AF areas can be divided into 9 areas and the area to be focused can be set.** **(P146)**

About [■] ([1-Area])

The camera focuses on the subject in the AF area on the center of the screen.

- **Position and size of the AF area can be changed.** **(P146)**
- When the subject is not in the center of the composition in [■], you can bring the subject into the AF area, fix the focus and exposure by pressing the shutter button halfway, move the camera to the composition you want with the shutter button pressed halfway, and then take the picture. (Only when the [Focus Mode] is set to [AFS].)

About [+] ([Pinpoint])

You can achieve a more precise focus on a point that is smaller than [■].

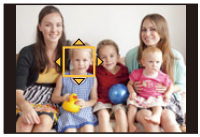
- **The focus position can be set on an enlarged screen.** **(P147)**
- Pressing the shutter button halfway displays the screen for checking the focus position enlarged to approximately 5 times original size.
 The time for which the display is enlarged can be set using [Pinpoint AF Time] (P54) in the [Custom] menu.
- The size of the AF area displayed when the camera has achieved focus may change according to the subject.
- In the following cases, [+] operates as [■]
 – When recording motion pictures

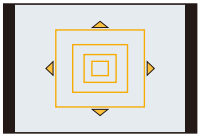
Setting up position of the AF area/changing size of the AF area

• Perform the operation after canceling the touch shutter function.

When selecting [👤], [■]

Position and size of the AF area can be changed.





1 **Select [👤] or [■] and press ▼.**
- AF area setting screen is displayed.

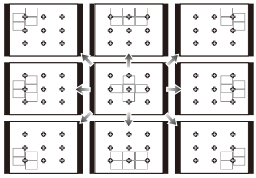
2 **Press ▲/▼/◀/▶ to move the AF area.**
- AF area can also be moved by touching the subject.
- Press [DISP.] to return the AF area to the center of the screen.

3 **Rotate the rear dial to change the size of AF area frame.**
- It can be changed to 4 different sizes.
- The area size can also be changed by pinching out/pinching in (P15) on the screen.

4 **Press [MENU/SET] to set.**
- AF area with the same function as [■] is displayed, when the [👤] is selected. Setting of the AF area is cleared when [MENU/SET] is pressed or [OFF] is touched.

When selecting [▦]

The 23 AF areas can be divided into 9 areas and the area to be focused can be set.



1 **Select [▦] and press ▼.**
- AF area setting screen is displayed.

2 **Press ▲/▼/◀/▶ to select the AF area frame.**
- AF area frame can also be selected by touching the screen.

3 **Press [MENU/SET] to set.**
- Only [+] display (center point of selected AF area frame) will remain on the screen.
- Setting of the AF area frame is cleared when [MENU/SET] is pressed or [OFF] is touched.

When selecting [⊞]

You can set the focus position precisely by enlarging the screen.

• The focus position cannot be set at the edge of the screen.



1 **Select [⊞] and press ▼.**

2 **Press ▲/▼/◄/► to set the focus position and then press [MENU/SET].**

- The assist screen is enlarged to approximately 5 times original size.
- The assist screen can also be displayed by touching the subject.

3 **Press ▲/▼/◄/► to align the subject on the cross point of the crosshair in the center of the screen.**

- The focus position can also be set by dragging the screen.
- Press [DISP.] to return the focus position to the center of the screen.
- On the assist screen, it is also possible to record a picture by touching [⬇].

■ Move the AF area easily with [Direct Focus Area] function

When the [Direct Focus Area] in the [Custom] menu is set to [ON] while [👤], [▤] or [▣] is selected, it is possible to move the AF area directly with the cursor button.

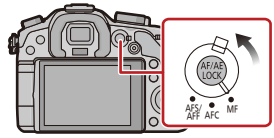
With [⊞], you can move the enlarged position.

- The spot metering target can also be moved to match the AF area when the [Metering Mode] (P162) is set to [⊡]. At the edge of the screen, the metering may be affected by the brightness around the AF area.
- [Direct Focus Area] is fixed to [OFF] in Creative Control Mode.
- When using digital zoom, the position and size of the AF area cannot be changed.

Taking Pictures with Manual Focus

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

Use this function when you want to fix the focus or when the distance between the lens and the subject is determined and you do not want to activate Auto Focus.

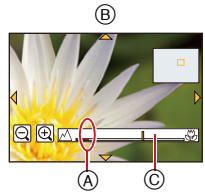


1 Set the focus mode lever to [MF].

2 Rotate the focus ring on the lens to focus on the subject.

Ⓐ Approximate indicator of ∞ (infinity)

- When the focus ring is rotated, display is switched to the assist screen and the image is enlarged (MF Assist Ⓑ). You can change the display method of the MF Assist at [MF Assist] in the [Custom] menu.
- MF guide Ⓒ is displayed on the screen when the focus ring is rotated if the [MF Guide] in the [Custom] menu is set to [ON]. You can check the direction of rotation of the focus ring is toward the near side or the far side.



MF ASSIST

Displaying the MF Assist

- It is displayed by rotating the focus ring or touching the screen. (In the Creative Control Mode [Miniature Effect], MF Assistance cannot be displayed by touching the screen)
- It can also be displayed by pressing [] to display the setup screen for the enlarged area, deciding the area to enlarge using the cursor button, and then pressing [MENU/SET].
- It will switch to the setting screen for the enlarged area by pressing the cursor button when the [Direct Focus Area] in the [Custom] menu is set to [ON].

Changing the display of the MF Assist

You can switch the magnification factor between approx. 4 times, 5 times and 10 times. In the case of 4 times magnification, the central region is magnified. In the case of 5 and 10 times magnification, the whole screen is magnified.

- To change the magnification, rotate the rear dial or touch []/[].

Moving the enlarged area

- The enlarged area can be moved by dragging the screen (P15), or pressing the cursor button.
- The following will return the MF assistance to the original position.
 - When the [Focus Mode] is set to other than [MF]
 - Changing [Aspect Ratio] or [Picture Size]
 - Turning the camera off
 - Pressing [DISP.] when the setting screen for determining the area to be enlarged is displayed.

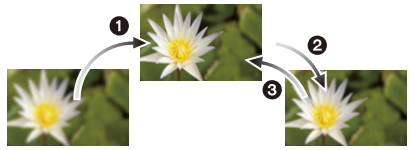
Closing the MF Assist

- It will close when the shutter button is pressed halfway.
- You can also close MF Assist by pressing [MENU/SET] or touching [Exit].
- When displayed by rotating the focus ring, it is closed approximately 10 seconds after the operation is stopped.

- The MF Assist is disabled when using the Digital Zoom or recording motion pictures.
- MF Assist or MF guide may not display depending on the lens used, but you can display MF Assist by direct operation of the camera, using the touch screen or a button.

Technique for Manual Focus

❶ Rotate the focus ring to focus on the subject.
❷ Rotate it a little more.
❸ Finely focus on the subject by rotating the focus ring slowly in reverse.



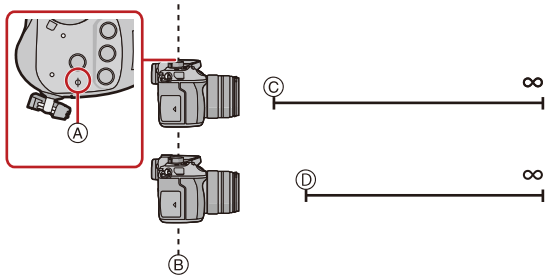
- If you zoom in/out after focusing on a subject, the focus may lose its accuracy. In that case, re-adjust the focus.
- After canceling Sleep Mode, focus on the subject again.
- If you are taking close-up pictures
 - We recommend using a tripod and the self-timer (P157).
 - The effective focus range (depth of field) is significantly narrowed. Therefore, if the distance between the camera and the subject is changed after focusing on the subject, it may become difficult to focus on it again.
 - The resolution of the periphery of the picture may decrease slightly. This is not a malfunction.

About the focus distance reference mark

The focus distance reference mark is a mark used to measure the focus distance. Use this when taking pictures with Manual Focus or taking close-up pictures.

Ⓐ Focus distance reference mark
Ⓑ Focus distance reference line
Ⓒ 0.25 m (0.82 feet) [When the interchangeable lens (H-HS12035) is used]
Ⓓ 0.5 m (1.6 feet) [When the interchangeable lens (H-VS014140) is used]

Focus range

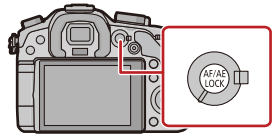


Fixing the Focus and the Exposure (AF/AE Lock)

Applicable modes: P A S M C1 C2 C3

This is useful when you want to take a picture of a subject outside the AF area or the contrast is too strong and you cannot achieve appropriate exposure.

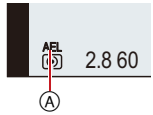
1 **Align the screen with the subject.**



2 **Press and hold [AF/AE LOCK] to fix the focus or exposure.**

- If you release [AF/AE LOCK], AF/AE Lock is canceled.
- Only the exposure is locked in the default setting.

3 **While pressing [AF/AE LOCK], move the camera as you compose the picture and then press shutter button fully.**



Ⓐ AE Lock indication

- When [AE LOCK] is set, after pressing the shutter button halfway to focus, press the shutter button fully.

■ AF/AE Lock

Locking of the focus and exposure can be set in [AF/AE Lock] in the [Custom] menu.

Item	Settings
[AE LOCK]	Only the exposure is locked. • [AEL], aperture value, the shutter speed light when the exposure is set.
[AF LOCK]	Only the focus is locked. • [AFL], the focus indication, aperture value, the shutter speed light when the subject is focused.
[AF/AE LOCK]	Both focus and exposure are locked. • [AFL], [AEL], the focus indication, aperture value and the shutter speed light when the subject is focused and the exposure is set.
[AF-ON]	Auto Focus Mode is activated.

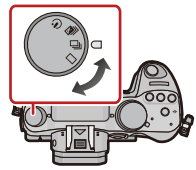
- If you set [AF/AE Lock Hold] in the [Custom] menu to [ON], you can fix the focus and the exposure even if you release [AF/AE LOCK] after pressing it. (P53) (Not available with [AF-ON])
- When AE lock is performed, the brightness of the recording screen that appears on the screen is fixed.
- AF Lock only is effective when taking pictures in Manual Exposure Mode.
- AE Lock only is effective when taking pictures with Manual Focus.
- Only the AF lock is active during motion picture recording. Once you cancel the AF lock during the recording, the AF lock cannot be reactivated.
- The exposure is set, even if the brightness of the subject changes.
- The subject can be focused again by pressing the shutter button halfway even when AE is locked.
- Program Shift can be set even when AE is locked.

Taking Pictures using Burst Mode

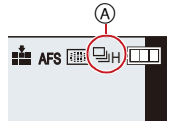
Applicable modes: iA iA+ P A S M M C1 C2 C3 SCN

Pictures are taken continuously while the shutter button is pressed.
Pictures taken with a burst speed of [SH] will be recorded as a single burst group (P79).

1 Set the drive mode dial to [].



2 Focus on the subject and take a picture.



Ⓐ When Burst Mode is set to high speed [H].

- Hold down the shutter button fully to activate the Burst Mode.

■ Changing the burst speed

1 **Select [Burst Rate] in the [Rec] menu. (P37)**

2 **Press ▲/▼ to select the burst speed and then press [MENU/SET].**

		[SH] (Super high speed)	[H] (High speed)	[M] (Middle speed)	[L] (Low speed)
Burst speed (pictures/second)		20	6	4	2
Live View during Burst Mode		None	None	Available	Available
∗1	With RAW files	—	18∗2, 3		
	Without RAW files	Max. 80	Depends on the capacity of the card∗3		

∗1 Number of recordable pictures

∗2 Depending on the recording conditions, the number of frames in a burst may be reduced. (For example, when [i.Resolution] of the recording menu is set to [EXTENDED], the number of frames in a burst may be reduced)

∗3 Pictures can be taken until the capacity of the card becomes full. However the burst speed will become slower halfway. The exact timing of this depends on the aspect ratio, the picture size, the setting for the quality and the type of card used.

- The Burst Mode speed may become slower depending on the following settings.
 – [Picture Size] (P160)/[Quality] (P161)/[Sensitivity] (P134)/[Focus Mode] (P142)/[Focus/Release Priority] (P55)
- Refer to P161 for information about RAW files.

Focusing in Burst Mode

The focus changes depending on the setting for [Focus/Release Priority] (P55) in the [Custom] menu and the Focus Mode setting.

Focus Mode	Focus/Release Priority	Focus
AFS	[FOCUS]	At the first picture
	[RELEASE]	
AFF/AFC*1	[FOCUS]	Normal focusing*2
	[RELEASE]	Predicted focusing*3
MF	—	Focus set with Manual Focus

*1 When the subject is dark or the burst speed is set to [SH], the focus is fixed on the first picture.
*2 The burst speed may become slower because the camera is continuously focusing on the subject.
*3 Burst speed takes priority, and focus is estimated within possible range.

- We recommend using the remote shutter (DMW-RSL1: optional) when you want to keep the shutter button pressed fully while taking pictures in Burst Mode. Refer to P268 for information about the remote shutter.
- When the burst speed is set to [SH] or [H] (when [Focus Mode] is [AFS] or [MF]), the exposure and White Balance are fixed at the settings used for the first picture for the subsequent pictures as well. Depending on the brightness of the subject, the second picture and subsequent pictures may be brighter or darker. When the burst speed is set to [H] (when [Focus Mode] is [AFF] or [AFC]), [M] or [L], they are adjusted each time you take a picture.
- Since the shutter speed becomes slower in dark places, the burst speed (pictures/second) may become slower.
- Depending on the operating conditions, it may take time to take the next picture if you repeat the recording of pictures.
- **It may take time to save pictures taken in Burst Mode on the card. If you take pictures continuously while saving, the maximum number of recordable pictures decreases. For continuous shooting, use of a high speed memory card is recommended.**
- The Burst Mode is disabled in the following cases.
 - [Glistening Water]/[Glittering Illuminations]/[Soft Image of a Flower] (Scene Guide Mode)
 - [Miniature Effect]/[Soft Focus]/[Star Filter] (Creative Control Mode)
 - When White Balance Bracket is set
 - When recording motion pictures
 - When recording using the flash
 - When [HDR] is set to [ON]
 - [Multi Exp.]
 - When using [Time Lapse Shot]
- [SH] of the Burst Mode is not available in the following cases.
 - When [Quality] is set to [RAW], [RAW] or [RAW]
 - [Shutter Delay]

Taking Pictures using Auto Bracket

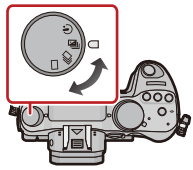
Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

Maximum of 7 pictures will be recorded with different exposure settings following the Exposure Compensation range every time the shutter button is pressed.

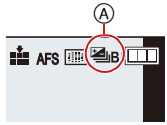
With Auto Bracket
[Step]: [3•1/3], [Sequence]: [0/−/+]

1st picture	2nd picture	3rd picture
		
±0 EV	−1/3 EV	+1/3 EV

1 Set the drive mode dial to [].



2 Focus on the subject and take a picture.



Ⓐ Auto Bracket indication

- If you press and hold the shutter button, the number of pictures that you set is taken.
- The Auto Bracket indication blinks until the number of pictures that you set is taken.
- The picture count is reset to [0] if you change the Auto Bracket setting or turn the camera off before all the pictures that you set are taken.

■ Changing the settings for [Single/Burst Settings], [Step] and [Sequence] in Auto Bracket

1. Select [Auto Bracket] in the [Rec] menu. (P37)
2. Press ▲/▼ to select [Single/Burst Settings], [Step] or [Sequence] and then press ►.
3. Press ▲/▼ to select the setting and then press [MENU/SET].

Item	Settings
[Single/Burst Settings]	[□] (single)
	[□] (burst)
[Step]	[3•1/3] (3 pictures)
	[3•2/3] (3 pictures)
	[3•1] (3 pictures)
	[5•1/3] (5 pictures)
	[5•2/3] (5 pictures)
	[5•1] (5 pictures)
	[7•1/3] (7 pictures)
	[7•2/3] (7 pictures)
	[7•1] (7 pictures)
[Sequence]	[0/−/+]
	[−/0/+]

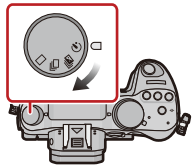
- You can take one picture at a time when set to [□].
- You can continuously take pictures up to set numbers when set to [□].
- Exit the menu after it is set.

- When taking pictures using Auto Bracket after setting the Exposure Compensation range, the pictures taken are based on the selected Exposure Compensation range.
- The exposure may be compensated incorrectly, depending on the brightness of the subject.
- When taking pictures continuously using Auto Bracket with [i.Resolution] set to [EXTENDED], it may take time to record all the set number of pictures.
- Auto Bracket is disabled in the following cases.
 - [Glistening Water]/[Glittering Illuminations]/[Soft Image of a Flower] (Scene Guide Mode)
 - [Miniature Effect]/[Soft Focus]/[Star Filter] (Creative Control Mode)
 - When White Balance Bracket is set.
 - When recording motion pictures
 - When recording using the flash
 - When [HDR] is set to [ON]
 - [Multi Exp.]
 - When using [Time Lapse Shot]

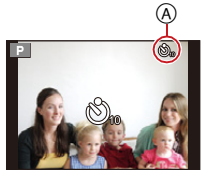
Taking Pictures with the Self-timer

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

1 **Set the drive mode dial to [⏲].**

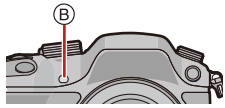


2 **Press the shutter button halfway to focus and then press it fully to take the picture.**



Ⓐ When self-timer is set to [⏲10].

- A picture is not taken until the subject is brought into focus. Focus and exposure will be set when the shutter button is pressed halfway.
- If you want to press the shutter button fully to take a picture even when the subject is not focused, set [Focus/Release Priority] in the [Custom] menu to [RELEASE]. (P55)
- The self-timer indicator Ⓑ blinks and the shutter is activated after 10 seconds (or 2 seconds).
- When [⏲10] is selected, the self-timer indicator blinks again after the first and the second pictures are taken and the shutter is activated 2 seconds after it blinks.



■ Changing the time setting for the self-timer

1 **Select [Self Timer] in the [Rec] menu.** **(P37)**
2 **Press ▲/▼ to select the mode and then press [MENU/SET].**

Item	Settings
⏲10	Picture is taken 10 seconds after shutter is pressed.
⏲10	After 10 seconds the camera takes 3 pictures at about 2 seconds intervals.
⏲2	Picture is taken 2 seconds after shutter is pressed. • When using a tripod, etc., this setting is a convenient way to avoid the jitter caused by pressing the shutter button.

- Exit the menu after it is set.

- We recommend using a tripod when recording with the self-timer.
- Depending on the recording conditions, the recording interval may become more than 2 seconds when [⏲10] is selected.
- The flash output may vary slightly when the [⏲10] is selected.
- It cannot be set to [⏲10] in the following conditions.
 – When White Balance Bracket is set
 – [Multi Exp.]
- Self-timer is disabled in the following cases.
 – When using [Time Lapse Shot]
 – When recording motion pictures

Using the [Rec] Menu

For details on [Rec] menu settings, refer to P37.

• [Photo Style], [Metering Mode], [i.Dynamic], [i.Resolution] and [Digital Zoom] are common to both the [Rec] menu and [Motion Picture] menu. Changing these settings in one of these menus is reflected in other menu.

[Photo Style]

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

6 effects can be selected to match the image you wish to record. It is possible to adjust the items such as color or picture quality of the effect to your desire.

Settings	Description of settings
STD. **[Standard]**	This is the standard setting.
VIVD **[Vivid]**＊	Brilliant effect with high saturation and contrast.
NAT **[Natural]**＊	Soft effect with low saturation.
MONO **[Monochrome]**	Monochrome effect with no color shades.
SCNY **[Scenery]**＊	An effect appropriate for sceneries with vivid blue skies and greens.
PORT **[Portrait]**＊	An effect appropriate for portraits with a healthy and beautiful skin tone.
CUST **[Custom]**＊	Use the setting registered in advance.

＊ This is disabled when Intelligent Auto (iA or iA+) Mode is selected.

• In Intelligent Auto (iA or iA+) Mode, the setting will be reset to [Standard] when the camera is switched to another Recording Mode or this unit is turned on and off.
• In Scene Guide Mode, a photo style which matches each scene is fixed.

Adjusting the picture quality

• Picture quality cannot be adjusted in the Intelligent Auto (or) Mode.

1 Press ◄/► to select the type of Photo Style.

• In Scene Guide Mode, you cannot select the photo style.

2 Press ▲/▼ to select the items, and then press ◄/► to adjust.



Item		Effect
[Contrast]	[+]	Increases the difference between the brightness and the darkness in the picture.
	[−]	Decreases the difference between the brightness and the darkness in the picture.
[Sharpness]	[+]	The picture is sharply defined.
	[−]	The picture is softly focused.
[Saturation]	[+]	The colors in the picture become vivid.
	[−]	The colors in the picture become natural.
[Noise Reduction]	[+]	The noise reduction effect is enhanced. Picture resolution may deteriorate slightly.
	[−]	The noise reduction effect is reduced. You can obtain pictures with higher resolution.

• Registered settings are memorized even if the camera is turned off.
• If you adjust the picture quality, [+] is displayed beside the Photo Style icon on the screen.
• Color can be changed by [Saturation] when [Monochrome] is selected.

3 Press ▼ to select [Custom setting] and then press [MENU/SET].

• Confirmation screen is displayed. It is executed when [Yes] is selected.
• Setting can be registered in [Custom].

[Aspect Ratio]

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

This allows you to select the aspect ratio of the pictures to suit printing or the playback method.

Settings	Description of settings
[4:3]	[Aspect Ratio] of a 4:3 TV
[3:2]	[Aspect Ratio] of a 35 mm film camera
[16:9]	[Aspect Ratio] of a high-definition TV, etc.
[1:1]	Square aspect ratio

• The ends of the recorded pictures may be cut at printing so check before printing. (P299)

[Picture Size]

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

Set the number of pixels. The higher the numbers of pixels, the finer the detail of the pictures will appear even when they are printed onto large sheets.

When the aspect ratio is [4:3].

Settings	Image size
L (16M)	4608×3456
EX M (8M)	3264×2448
EX S (4M)	2336×1752

When the aspect ratio is [3:2].

Settings	Image size
L (14M)	4608×3072
EX M (7M)	3264×2176
EX S (3.5M)	2336×1560

When the aspect ratio is [16:9].

Settings	Image size
L (12M)	4608×2592
EX M (6M)	3264×1840
EX S (2M)	1920×1080

When the aspect ratio is [1:1].

Settings	Image size
L (12M)	3456×3456
EX M (6M)	2448×2448
EX S (3M)	1744×1744

• When [Ex. Tele Conv.] (P120) is set, [EX] is displayed on the picture sizes of each aspect ratio except for [L].
• The picture size will be fixed to [S] when [Burst Rate] is set to [SH].

[Quality]

Applicable modes: iA iA+ P A S M M C1 C2 C3 SCN

Set the compression rate at which the pictures are to be stored.

Settings	File format	Description of settings
[▪▪▪]	JPEG	A JPEG image in which image quality was given priority.
[▪▪▪]		A standard image quality JPEG image. This is useful for increasing the number of shots without changing the number of pixels.
[RAW▪▪▪]	RAW+JPEG	You can record a RAW image and a JPEG image ([▪▪▪] or [▪▪▪]) simultaneously.*1
[RAW▪▪▪]		
[RAW]	RAW	You can only record RAW images.*2

*1 If you delete a RAW file from the camera, the corresponding JPEG image will also be deleted.

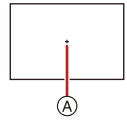
*2 It is fixed to maximum recordable pixels ([L]) for each image aspect ratio.

- You can enjoy more advanced picture editing if you use RAW files. You can save RAW files in a file format (JPEG, TIFF etc.) that can be displayed on your PC etc., develop them and edit them using the software “SILKYPIX Developer Studio” by Ichikawa Soft Laboratory on the CD-ROM (supplied).
- The following effects are not reflected in RAW images:
 – [Photo Style]/[i.Dynamic]/[Red-Eye Removal]/[i.Resolution]/[Color Space] ([Rec] menu)
 – Scene Guide Mode
 – Creative Control Mode
- [RAW] images are recorded with a smaller data volume than [RAW▪▪▪] or [RAW▪▪▪].

[Metering Mode]

Applicable modes: P A S M C1 C2 C3

Type of optical measurement to measure brightness can be changed.

Settings	Description of settings
[⊙] (Multiple)	This is the method in which the camera measures the most suitable exposure by judging the allocation of brightness on the whole screen automatically. Usually, we recommend using this method.
[◎] (Center weighted)	This is the method used to focus on the subject on the center of the screen and measure the whole screen evenly.
[·] (Spot)	This is the method to measure the subject in the spot metering target Ⓐ. 

[Burst Rate]

Settings: [SH]/[H]/[M]/[L]

• Refer to P153 for details.

[Auto Bracket]

Settings: [Single/Burst Settings]/[Step]/[Sequence]

• Refer to P155 for details.

[Self Timer]

Settings: [10]/[10]/[2]

• Refer to P157 for details.

[i.Dynamic] (Intelligent dynamic range control)

Applicable modes: P A S M C1 C2 C3

Contrast and exposure will be adjusted automatically when there is a big difference in brightness between the background and subject, to bring the image close to how you see.

Settings: [HIGH]/[STANDARD]/[LOW]/[OFF]

- This feature may be automatically disabled, depending on the lighting conditions.
- [HIGH], [STANDARD], or [LOW] represents the maximum range of effect.
- In the following cases, [i.Dynamic] does not work:
 – When [HDR] is set to [ON]

[i.Resolution]

Applicable modes: P A S M C1 C2 C3

Pictures with sharp profile and resolution can be taken by using the Intelligent Resolution Technology.

Settings: [HIGH]/[STANDARD]/[LOW]/[EXTENDED]/[OFF]

- [EXTENDED] allows you to take natural pictures with a higher resolution.
- The speed of burst and continuous recording becomes slower when [EXTENDED] is used.
- When recording a motion picture, [EXTENDED] changes to [LOW].

[HDR]

Applicable modes: P A S M C1 C2 C3

You can combine 3 pictures with different levels of exposure into a single picture with rich gradation. You can minimize the loss of gradations in bright areas and dark areas when, for example, the contrast between the background and the subject is large.
An image combined by HDR is recorded in JPEG.

Settings	Description of settings
[ON]	Records HDR pictures.
[OFF]	Does not record HDR pictures.
[SET]	**[Dynamic Range]** [AUTO]: Automatically adjusts the exposure range according to the differences between the bright and dark areas. [±1 EV]/[±2 EV]/[±3 EV]: Adjusts the exposure within the selected exposure parameters. **[Auto Align]** [ON]: Automatically corrects camera shake (jitter) and other problems that can cause the images to misalign. Recommended for use during hand-held shooting. [OFF]: Image misalignment not adjusted. Recommended when a tripod is used.

■ What Is HDR?

HDR stands for High Dynamic Range and refers to a technique for expressing a wide contrast range.

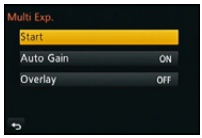
- Do not move the camera during the continuous shooting after pressing the shutter button.
- You cannot take the next picture until the combination of pictures is complete.
- A moving subject may be recorded with unnatural blurs.
- The angle of view becomes narrow slightly when [Auto Align] is set to [ON].
- Flash is fixed to [⊗] ([Forced Flash Off]).
- [HDR] does not work for the pictures taken during a motion picture recording.
- [HDR] is not available in the following cases.
 – When [Quality] is set to [RAW], [RAW] or [RAW]
 – When using [Time Lapse Shot]

[Multi Exp.]

Applicable modes: P A S M C1 C2 C3

You can shoot up to four exposures per image.

1 **Select [Start] and then press [MENU/SET].**



2 **Decide on the composition, and take the first picture.**

- After taking the picture, press the shutter button halfway down to take the next picture.
- Press ▲/▼ to select the item and then press [MENU/SET] for one of the following operations.



[Next]:	Advance to the next picture.
[Retake]:	Return to the first picture.
[Exit]:	Record the image of the first picture, and finish the multiple exposure picture-taking session.

3 **Shooting the second, third, and fourth exposures.**

- If [MENU/SET] is pressed while taking pictures, the photographed images are recorded, and the multiple exposure picture-taking session will be completed.

4 **Press ▼ to select [Exit] and then press [MENU/SET].**

- You can also press the shutter button halfway to finish.



About Automatic Gain Control setting

Select [Auto Gain] on the screen shown in step ***1*** and set it.

[ON]: The brightness level is adjusted according to the number of pictures taken and the pictures are superimposed over each other.

[OFF]: Compensate the exposure to match the subject so that all the superimposed exposure effects will be just right.

Combining RAW images in the card

On the screen shown in step ***1***, set [Overlay] to [ON]. After [Start], Images in the card will be displayed. Select the RAW images, press [MENU/SET], and continue recording.

- [Overlay] is available only for RAW images taken with this unit.

- Image is not recorded until completion.
- The recording information displayed for pictures taken with multiple exposures is the recording information for the last picture taken.
- Items shown in gray on the menu screen cannot be set during multiple exposures.
- This operation is not available when using [Time Lapse Shot].

[Time Lapse Shot]

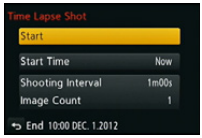
Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

You can set the recording start time, the recording interval and the number of pictures, and automatically record subjects such as animals and plants as time elapses.

• **Set the date and time settings in advance.** (P35)

■ Set the recording time/interval/number of pictures

1 **Press ▲/▼ to select the item and then press [MENU/SET].**



Item	Description of settings	
[Start Time]	[Now]	Starts the recording by fully-pressing the shutter button.
	[Start Time Set]	You can set the time to start recording. Any time up to 24 hours ahead can be set. • Press ▲/▼/◄/► to set the start time (hour, minute), and then press [MENU/SET].
[Shooting Interval]	You can set the second-scale recording interval from 1 second to 99 minutes 59 seconds. • Press ▲/▼/◄/► to set the recording interval (minute, second), and then press [MENU/SET].	
[Image Count]	1 to 9999 • Press ▲/▼/◄/► to set the number of pictures, and then press [MENU/SET].	

2 Press ▲/▼ to select [Start] and then press [MENU/SET].

3 Press the shutter button fully.

- The recording starts automatically.
- During recording standby, the power will turn off automatically if no operation is performed for a certain period. The Time Lapse Shot is continued even with the power turned off. When the recording start time arrives, the power turns on automatically. To turn on the power manually, press the shutter button halfway.
- When the [Fn1] is pressed while this unit is turned on, it will display selection screen for pause or end. Operate in accordance with the screen. Also, when the [Fn1] is pressed while paused, it will display selection screen for pause or end. You can also restart from a pause by fully pressing the shutter button.

- This function is not for use in a security camera.
- **If you leave the unit somewhere to perform [Time Lapse Shot], please be careful of theft.**
- **Recording for long periods in cold places such as ski resorts or places at high altitude, or in warm, wet environments may cause a malfunction, so please be careful.**
- Recording may be skipped when the recording time is longer than the recording interval, such as long time exposure.
- We recommend to use a fully charged battery.
- [Time Lapse Shot] is paused in the following cases.
 During [Time Lapse Shot], you can replace the battery and the card, and then restart by turning on this unit. Turn off this unit when replacing the battery or the card.
 – When the charge on the battery runs out
 – When the number of recordable pictures drops to none
 – Turning the camera off
- Do not connect the AV cable (optional), the HDMI mini cable (optional), or the USB connection cable (supplied) during Time Lapse Shooting.

[Electronic Shutter]

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

The electronic shutter can reduce the picture blur. Moreover, you can take pictures without the shutter sound when the camera is used in a quiet location.
Settings: [ON]/[OFF]

- Flash is fixed to [⊘] ([Forced Flash Off]).
- If a subject is moving or your hands are shaking, the subject may appear distorted on the picture taken. Use of a tripod is recommended.
- Under the fluorescent lighting or LED lighting, etc., horizontal stripes may appear on the recorded pictures.
- [Electronic Shutter] is disabled when [Burst Rate] is set to [SH].
- You can turn off the shutter sound at [E-Shutter Vol] in [Beep]. (P46)
- **Be sure to pay special attention to the privacy, the likeness rights, etc. of the subject when you use this function. Use at your own risk.**

[Shutter Delay]

Applicable modes: P A S M C1 C2 C3

To reduce the influence of hand shake or shutter vibration, shutter is released after the specified time has passed.
Settings: [8SEC]/[4SEC]/[2SEC]/[1SEC]/[OFF]

- [Shutter Delay] is not available in the following cases.
 – When [Burst Rate] is set to [SH]
 – When [HDR] is set to [ON]

[Flash]

Settings: [Firing Mode]/[Flash Mode]/[Flash Synchro]/[Flash Adjust.]/[Auto Exposure Comp.]/[Manual Flash Adjust.]/[Wireless Channel]/[Wireless FP]/[Communication Light]/[Wireless Setup]

- Refer to P125 for details.

[Red-Eye Removal]

Applicable modes: P A S M C1 C2 C3

When Red-Eye Reduction ([]), []) is selected, Digital Red-Eye Correction is performed whenever the flash is used. The camera automatically detects red-eye and corrects the picture.

Settings: [ON]/[OFF]

- Only available when [AF Mode] is set to [] and Face Detection is active.
- Under certain circumstances, red-eye cannot be corrected.
- [] is displayed on the icon when it is set to [ON].

[ISO Increments]

Applicable modes: P A S M C1 C2 C3 SCN

You can adjust the ISO sensitivity settings for every 1/3 EV.

Settings	Description of settings
[1/3 EV]	[L.125]*/[L.160]*/[200]/[250]/[320]/[400]/[500]/[640]/[800]/[1000]/[1250]/[1600]/[2000]/[2500]/[3200]/[4000]/[5000]/[6400]/[8000]/[10000]/[12800]/[H.16000]*/[H.20000]*/[H.25600]*
[1 EV]	[L.125]*/[200]/[400]/[800]/[1600]/[3200]/[6400]/[12800]/[H.25600]*

* Only available when [Extended ISO] is set.

- When the setting is changed from [1/3 EV] to [1 EV], [Sensitivity] will be set to value closest to the value set during the [1/3 EV]. (Set value will not restore when the setting is changed back to [1/3 EV]. It will stay as the setting selected for [1 EV].)

[Extended ISO]

Applicable modes: P A S M C1 C2 C3 SCN

Allows you to adjust the ISO from the minimum [ISO125] to the maximum [ISO25600].

Settings: [ON]/[OFF]

[Long Shtr NR]

Applicable modes: P A S M C1 C2 C3 SCN

The camera automatically removes noise that appears when the shutter speed becomes slower to take pictures of night scenery etc. so you can take beautiful pictures.

Settings: [ON]/[OFF]

- If you set [ON], the countdown screen is displayed when the shutter button is pressed. Do not move the camera at this time. After the countdown is finished, [Please wait...] is displayed for the same time as the selected shutter speed for signal processing.
- We recommend using a tripod when the shutter speed is slowed to take pictures.
- In the following cases, [Long Shtr NR] does not work:
 - When recording motion pictures
 - When [Burst Rate] is set to [SH]
 - When [Electronic Shutter] is set to [ON]

[Shading Comp.]

Applicable modes: P A S M C1 C2 C3 SCN

When the screen periphery darkens as a result of the lens characteristics, you can record pictures with the brightness of the screen periphery corrected.

Settings: [ON]/[OFF]

- This feature may be automatically disabled, depending on the recording conditions.
- Noise in the periphery of the picture may stand out with higher ISO sensitivity.
- Correction is not possible in the following cases:
 - When recording motion pictures
 - Recording still pictures while recording a motion picture [only when set to [] (motion picture priorities)].
 - When [Burst Rate] is set to [SH].
- Depending on the lens used, [Shading Comp.] may not operate.
 Refer to the website for compatible lenses.

[Ex. Tele Conv.]

Settings:[ZOOM]/[TELE CONV.]/[OFF]

- Refer to P120 for details.

[Digital Zoom]

Settings: [4×]/[2×]/[OFF]

- Refer to P119 for details.

[Color Space]

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

Set this when you want to correct the color reproduction of the recorded pictures on a PC, printer etc.

Settings	Description of settings
[sRGB]	Color space is set to sRGB color space. This is widely used in computer related equipment.
[AdobeRGB]	Color space is set to AdobeRGB color space. AdobeRGB is mainly used for business purposes such as professional printing because it has a greater range of reproducible colors than sRGB.

- Depending on the color space setting, the file name of the recorded picture changes as shown.

 P1000001.JPG
 - P: sRGB
 - _: AdobeRGB
- Set to sRGB if you are not very familiar with AdobeRGB.
- The setting is fixed to [sRGB] when recording motion pictures.

[Stabilizer]

Settings: []/[]/[OFF]

- Refer to P117 for details.

[Face Recog.]

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

Face Recognition is a function which finds a face resembling a registered face and prioritizes focus and exposure automatically. Even if the person is located towards the back or on the end of a line in a group photo, the camera can still take a clear picture.
Settings: [ON]/[OFF]/[MEMORY]

[Face Recog.] is initially set to [OFF] on the camera.
[Face Recog.] will turn [ON] automatically when the face image is registered.



- **The following functions will also work with the Face Recognition function.**

In Recording Mode

– Display of corresponding name when camera detects a registered face* (if name has been set for the registered face)

In Playback Mode

– Display of name and age (if information has been registered)
– Selective playback of pictures chosen from pictures registered with Face Recognition ([Category Play] (P194))

* Names of up to 3 people are displayed. Precedence for the names displayed when taking pictures is determined according to the order of registration.

- **[Face Recog.] only works when the AF Mode is set to [👤].**
- During the Burst Mode, [Face Recog.] picture information can be attached to only the first picture.
- You cannot use [Face Recog.] in the following cases.
 – [Clear Nightscape]/[Cool Night Sky]/[Warm Glowing Nightscape]/[Artistic Nightscape]/[Glittering Illuminations]/[Appetizing Food]/[Cute Dessert] (Scene Guide Mode)
 – [Miniature Effect] (Creative Control Mode)
 – When recording motion pictures
- Similarity in facial features can result in one person being recognized as another.
- Face Recognition may take more time to select and recognize distinctive facial features than regular Face Detection.
- Even when face recognition information has been registered, pictures taken with [Name] set to [OFF] will not be categorized by face recognition in [Category Play].
- **Even when Face Recognition information is changed (P175), Face Recognition information for the pictures already taken will not be changed.**
 For instance, if the name is changed, pictures recorded before the change will not be categorized by face recognition in [Category Play].
- To change the name information of the pictures taken, perform the [REPLACE] in [Face Rec Edit] (P206).

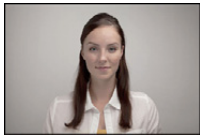
Face Settings

You can register information such as names and birthdays for face images of up to 6 people.
Registration can be facilitated by taking multiple face images of each person (up to 3 pictures/registration).

■ Point of recording when registering the face images

- Face front with eyes open and mouth closed, making sure the outline of the face, the eyes, or the eyebrows are not covered with hair when registering.
- Make sure there is no extreme shading on the face when registering. (Flash will not flash during registration.)

(Good example for registering)



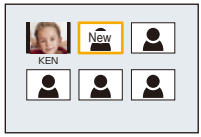
■ When face is not recognized during recording

- Register the face of same person indoors and outdoors, or with different expressions or angles. (P175)
- Additionally register at the location of recording.
- When a person who is registered is not recognized, correct by re-registering.
- Face Recognition may not be possible or may not recognize faces correctly even for registered faces, depending on the facial expression and environment.

1 Press ▲/▼ to select [MEMORY] and then press [MENU/SET].

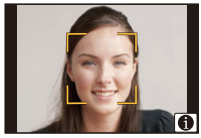
2 Press ▲/▼/◄/► to select the Face Recognition frame that is not registered, and then press [MENU/SET].

- [New] will not display if there are 6 people already registered. Delete a person already registered to register a new person.



3 Take the picture adjusting the face with the guide.

- Confirmation screen is displayed. It is executed when [Yes] is selected.
- The faces of subjects other than people (pets, etc.) cannot be registered.
- To display the description of the face registration, press ► or touch [ⓘ].



4 **Press ▲/▼ to select the item and then press [MENU/SET].**

• You can register up to 3 face images.

Item	Description of settings
[Name]	It is possible to register names. ❶ Press ▼ to select [SET] and then press [MENU/SET]. ❷ Enter the name. • For details on how to enter characters, refer to “Entering Text” section on P64. • A maximum of 9 characters can be entered. • Up to 6 characters can be entered for [＼], [「], [」], [•] and [—].
[Age]	It is possible to register the birthday. ❶ Press ▼ to select [SET] and then press [MENU/SET]. ❷ Press ◄/► to select the items (Year/Month/Day), and then press ▲/▼ to set and then press [MENU/SET].
[Add Images]	To add additional face images. **(Add Images)** ❶ Select the unregistered face recognition frame, and then press [MENU/SET]. ❷ Perform steps ***3*** in “Face Settings”.
	To delete one of the face images. **(Delete)** **Press ◄/► to select the face image to delete, and then press [MENU/SET].** • This feature requires that at least one facial image remain, once registered. • Confirmation screen is displayed. It is executed when [Yes] is selected.

• Exit the menu after it is set.

Change or delete the information for a registered person

You can modify the pictures or information of an already registered person. You can also delete the information of the registered person.

1 **Press ▼ to select [MEMORY] and press [MENU/SET].**
2 **Press ▲/▼/◄/► to select the face image to edit or delete and then press [MENU/SET].**
3 **Press ▲/▼ to select the item and then press [MENU/SET].**

Item	Description of settings
[Info Edit]	Changing the information of an already registered person. **Perform step *4* in "Face Settings".**
[Priority]	The focus and exposure are preferentially adjusted for higher-priority faces. **Press ▲/▼/◄/► to select the priority and then press [MENU/SET].**
[Delete]	Deleting information of a registered person. • Confirmation screen is displayed. It is executed when [Yes] is selected.

• Exit the menu after it is set.

[Profile Setup]

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

If you set the name and birthday of your baby or pet in advance, you can record their name and age in months and years in the images.
You can display these at playback or stamp the recorded images using [Text Stamp] (P197).

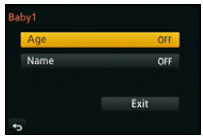
Settings: [1] ([Baby1])/[2] ([Baby2])/[Pet] ([Pet])/[OFF]/[SET]

■ Setting [Age] or [Name]

1 **Press ▲/▼ to select [SET] and then press [MENU/SET].**

2 **Press ▲/▼ to select [Baby1], [Baby2] or [Pet] and then press [MENU/SET].**

3 **Press ▲/▼ to select [Age] or [Name] and then press [MENU/SET].**



4 **Press ▲/▼ to select [SET] and then press [MENU/SET].**

Enter [Age]
Birthday:
◄/►: Select the items (year/month/day)
▲/▼: Setting
[MENU/SET]: Set

Enter [Name]
For details on how to enter characters, refer to “Entering Text” on P64.
- A maximum of 30 characters can be entered.
- Up to 15 characters can be entered for [＼], [「], [」], [・] and [—].

5 **Press ▼ to select [Exit] and then press [MENU/SET] to finish.**

■ To cancel [Age] and [Name]

Select the [OFF] setting in step **1**.

- Still pictures recorded during motion picture recording ([] (motion picture priorities)) (P183) will not record age or name.
- The age and name can be printed out using the “PHOTOfunSTUDIO” bundled software on the CD-ROM (supplied).

Recording Motion Picture

Applicable modes: iA iA+ P A S M M C1 C2 C3 SCN

This can record full high definition motion pictures compatible with the AVCHD format or motion pictures recorded in MP4, MOV.
Audio will be recorded in stereo.
The functions available when recording motion pictures differ according to the lens you are using, and the operational sound of the lens may be recorded.
Refer to page 19 for details.

Setting the format, size and frame rate

1 **Select [Rec Mode] in the [Motion Picture] menu.** (P37)

2 **Press ▲/▼ to select the item and then press [MENU/SET].**

Item	Format
[AVCHD]	Select this format to record HD (high definition) video for playback on your HDTV using an HDMI connection.
[MP4]	Select this format to record standard definition video for playback on your PC.
[MOV]	Data format for image editing.

- When [MOV] is selected, confirmation screen is displayed. Select [Yes] to execute.

3 **Press ▲/▼ to select [Rec Quality] and then press ►.**

4 **Press ▲/▼ to select the item and then press [MENU/SET].**

- Exit the menu after it is set.

When [AVCHD] is selected

Item	Size	Frame rate	Bit rate
[FHD/60p][*1]	1920×1080	60p	28 Mbps
[FHD/60i]	1920×1080	60i	17 Mbps
[FHD/30p]	1920×1080	60i[*2]	24 Mbps
[FHD/24p]	1920×1080	24p	24 Mbps

∗1 AVCHD Progressive
∗2 The sensor output is 30 frames/second

When [MP4] is selected

Item	Size	Frame rate	Bit rate
[FHD/30p]	1920×1080	30	20 Mbps
[HD/30p]	1280×720		10 Mbps
[VGA/30p]	640×480		4 Mbps

When [MOV] is selected

Item	Size	Frame rate	Bit rate
[FHD/60p]	1920×1080	60p	50 Mbps
[FHD/30p/ I] (ALL-Intra)	1920×1080	30p	72 Mbps
[FHD/30p]	1920×1080	30p	50 Mbps
[FHD/24p/ I] (ALL-Intra)	1920×1080	24p	72 Mbps
[FHD/24p]	1920×1080	24p	50 Mbps
[HD/60p/ I] (ALL-Intra)	1280×720	60p	72 Mbps

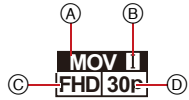
About the compatibility of the recorded motion pictures

The picture quality or sound quality of recorded motion pictures may be deteriorated even when they are played back with the compatible devices. Also, recording information may not be displayed correctly. Use this unit to playback in such case.

- If you want to use another device to play back motion pictures recorded in [FHD/60p], [FHD/30p], [FHD/24p] of [AVCHD] or if you want to transfer them to the device, a PC installed with "PHOTOfunSTUDIO" or a compatible Blu-ray disc recorder is required.
- If you want to use another device to play back or edit motion pictures recorded in [MOV], a high-performance PC environment or a PC installed with "PHOTOfunSTUDIO" is required.
- Please check the following website about the compatible devices for details.
 http://panasonic.jp/support/global/cs/dsc/
 (This Site is English only.)

Indication of the icon

Ⓐ Format
Ⓑ ALL-Intra
Ⓒ Size
Ⓓ Frame rate (sensor output)



- "ALL-Intra" refers to a data compression method in which each frame is compressed. The file size of motion pictures recorded in this method becomes larger, but this method can prevent the loss of image quality because editing does not require re-encoding.
- What is bit rate
 This is the volume of data for a definite period of time, and the quality becomes higher when the number gets bigger. This unit is using the "VBR" recording method. "VBR" is an abbreviation for "Variable Bit Rate", and the bit rate (volume of data for definite period of time) is changed automatically depending on the subject to record. Therefore, the recording time is shortened when a subject with fast movement is recorded.

How to set focus when recording a motion picture (Continuous AF)

Focusing changes depending on the Focus Mode setting and the [Continuous AF] setting in the [Motion Picture] menu.

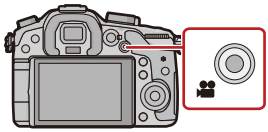
Focus Mode	Settings
AFS/AFF/AFC	The camera automatically keeps focusing on subjects during recording.* • To readjust the focus, press the shutter button halfway.
MF	You can focus manually.

* When [Continuous AF] is set to [OFF], the focus is locked to the position set at the start of recording.

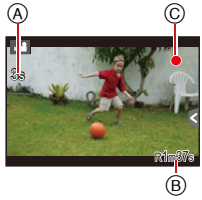
- Depending on the recording conditions or lens used, operational sound may be recorded when the Auto Focus is operated while recording a motion picture. It is recommended to record with [Continuous AF] in the [Motion Picture] menu set to [OFF], if the sound of operation bothers you to avoid recording the lens noise.
- When operating the zoom when recording motion pictures, it may take time to come into focus.

Recording Motion Picture

1 Start recording by pressing the motion picture button.



Ⓐ Elapsed recording time
Ⓑ Available recording time



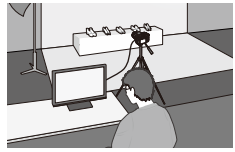
- Recording of motion picture appropriate for each mode is possible.
- The recording state indicator (red) Ⓒ will flash while recording motion pictures.
- If approximately 10 seconds elapses without an operation being performed, part of the display will disappear. Press [DISP.] or touch the monitor to make the display reappear.
- When recording a motion picture, do not cover the microphone with your fingers or other objects.
- Release the motion picture button right after you press it.

2 Stop the recording by pressing the motion picture button again.

- The available recording time displayed on the screen may not decrease regularly.
- Depending on the type of the card, the card access indication may appear for a while after recording motion pictures. This is not a malfunction.
- When the aspect ratio setting is different in still and motion pictures, the angle of view changes at the start of motion picture recording. When [Rec Area] (P59) is set to [], angle of view during motion picture recording is displayed.
- When the Extended Tele Conversion is used, the angle of view will change when the screen is switched between the still picture screen and motion picture screen, because the zoom factor is different between still pictures and motion pictures. (P119)
- If you end motion picture recording after a short time when using [Miniature Effect] of the Creative Control Mode, the camera may go on recording for a certain period. Please continue to hold the camera until the recording finishes.
- The [Sensitivity] will be set to [AUTO] (for motion pictures) when recording motion pictures. Also, the ISO Limit Set will not operate.
- When recording a motion picture, [Stabilizer] will be fixed to [] even if it is set to [].
- It is recommended to use a fully charged battery or AC adaptor (optional) when recording motion pictures. (P269)
- If while recording motion pictures using the AC adaptor (optional) the power supply is cut off due to a power cut or if the AC adaptor (optional) is disconnected etc., the motion picture will not be recorded.
- Motion pictures cannot be recorded in the following cases.
 - [Glistening Water]/[Glittering Illuminations]/[Soft Image of a Flower] (Scene Guide Mode)
 - [Soft Focus]/[Star Filter] (Creative Control Mode)
 - When using [Time Lapse Shot]
- It will be recorded in the following categories for certain Recording Modes. A motion picture recording matching each Recording Mode will be performed for the ones not listed below.

Selected Recording Mode	Recording Mode while recording motion picture
• Program AE Mode • Aperture-Priority AE Mode • Shutter-Priority AE Mode • Manual Exposure Mode	Normal motion picture
• [Clear in Backlight] (Scene Guide Mode)	Portrait Mode
• [Clear Nightscape]/[Artistic Nightscape]/[Clear Night Portrait] (Scene Guide Mode)	Low Light Mode

Recording while monitoring camera images



During HDMI output, you can record while monitoring motion pictures on the TV, etc.
Refer to P250 on how to connect with TV by using HDMI mini cable (optional).

■ Switching the information displayed

You can change the display shown during HDMI output using [HDMI Info Display (Rec)] in [Output] (P49) on the [Setup] menu.

[ON]: The camera display is output as is.

[OFF]: Only images are output.

Checking the sound while recording motion pictures

You can record motion pictures while hearing the sounds that are being recorded by connecting a commercially available headphones to this unit.

■ Switch the sound output method

Sound output method can be changed at [Headphone Sound] in the [Motion Picture] menu.

[REAL TIME]: Actual sound.

[REC SOUND]: Sound that is being recorded in motion pictures.

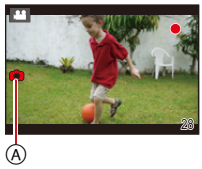
• Do not use the headphone cables with the length of 3 m (9.8 feet) or more.

Recording still pictures while recording motion pictures

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

Still pictures can be recorded even while recording a motion picture. (Simultaneous recording)

During motion picture recording, press the shutter button fully to record a still picture.



- Simultaneous recording indicator Ⓐ is displayed while recording still pictures.
- Recording with the Touch Shutter function (P70) is also available.

■ Setting motion picture and still picture priorities

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

Recording method for the still pictures taken while recording a motion picture can be set with [Picture Mode] in the [Motion Picture] menu.

Item	Settings
(Motion picture priorities)	• Pictures will be recorded with a picture size of [S] (2 M). The picture quality may be different to [S] (2 M) of standard pictures. • Only JPEG images are recorded when [Quality] is set to [RAW], [RAW] or [RAW]. (When set to [RAW], still pictures will be recorded in [Quality] of [].) • Up to 40 still pictures can be taken during recording of the motion picture. • In the Creative Control Mode [Miniature Effect], there may be a slight delay between fully pressing the shutter button and recording.
(Still picture priorities)	• Pictures will be recorded with the set picture size and quality. • The screen will go dark while recording pictures. A still picture will be recorded in the motion picture during that period, and audio is not recorded. • Up to 10 still pictures can be recorded during recording of the motion picture.

- The picture aspect ratio will be fixed to [16:9].
- Simultaneous recording is not possible in the following cases:
 - When [Rec Mode] is set to [VGA/30p] in [MP4]
 - When the [FHD/24p] or [FHD/24p/] is set [only when [] (still picture priorities) is set]

Recording motion pictures with manually set aperture value/shutter speed (Creative Video Mode)

Recording Mode: 

It is possible to manually change the aperture and shutter speed and record motion pictures.

1 **Set the mode dial to [].**

2 **Select [Exposure Mode] in the [Motion Picture] menu.** (P37)

3 **Press ▲/▼ to select [P], [A], [S] or [M], and then press [MENU/SET].**

- The operation for changing the aperture value or shutter speed is the same as the operation for setting the mode dial to **P**, **A**, **S** or **M**.

4 **Start recording.**

- Press the motion picture button or the shutter button to start recording a motion picture. (Still pictures cannot be taken.)

5 **Stop recording.**

- Press the motion picture button or the shutter button to stop recording a motion picture.

- **Aperture value**
 - Set the aperture value to a higher number when you want a sharp focus background. Set the aperture value to a lower number when you want a soft focus background.
- **Shutter speed**
 - When you want to take a sharp picture of a fast moving subject, set with a faster shutter speed. When you want to create a trail effect, set to a slower shutter speed.
 - Manually setting a higher shutter speed may increase the noise on-screen due to the higher sensitivity.
 - When subjects are recorded in an extremely bright place or under fluorescent/LED lighting, the color tone or brightness of the image may change, or horizontal stripes may appear on the screen. In that case, change the Recording Mode or manually adjust the shutter speed to 1/60 or 1/100.
- The shutter speed varies depending on [Frame Rate]. (P185)
- You can change the settings during the motion picture recording. In that case, operating sound may be recorded. Use of the [Silent Operation] is recommended. (P186)

Motion pictures in slow and fast motion

Change the number of frames recorded and record motion pictures in slow and fast motion.

1 **Select [Frame Rate] in the [Motion Picture] menu.** (P37)
2 **Press ▲/▼/◄/► to select the item and then press [MENU/SET].**

Item	Settings
[OFF]	—
40%/48%/80%	Records 0.4 times, 0.48 times, and 0.8 times slower
160%/200%/300%	Records 1.6 times, 2.0 times, and 3.0 times faster

- For example, when a motion picture is recorded for 10 seconds with [200%], the length of the recorded motion picture will be 5 seconds.
- Exit the menu after it is set.

- When [Frame Rate] is set to any of the options other than [OFF], the image quality is locked to the values below even when [Rec Mode] is set to [AVCHD], [MP4], or [MOV].

Item	Size	Frame rate	Bit rate
[FHD/24p]	1920×1080	24p	24 Mbps

- To playback or import the motion pictures recorded in slow and fast motion on equipment other than this unit, a compatible Blu-ray disc recorder or “PHOTOfunSTUDIO” is required.
- Audio is not recorded.
- [Wind Cut], [Mic Level Disp.] and [Mic Level Adj.] in the [Motion Picture] menu cannot be used.
- We recommend using a tripod.
- The recording time display used for playing back motion pictures recorded in slow and fast motion at the top right of the screen is different from the one used for normal motion pictures.
 [▶ XXhXXmXXs]: Actual playback time
 [XXhXXmXXs]: Actual recording time of the motion picture during recording

Minimizing operational sounds during motion picture recording

The operational sound of the zoom or button operation may be recorded when it is operated during the recording of a motion picture.
Using touch icons allows silent operation while recording motion pictures.
• Set [Silent Operation] in the [Motion Picture] menu to [ON].

1 **Start recording.**

2 **Touch [].**

3 **Touch icon to display the setting screen.**

T W	Zoom (When an interchangeable lens compatible with power zoom is used)
F	Aperture value
SS	Shutter speed
	Exposure Compensation
ISO	ISO sensitivity
	Mic level adjustment

4 **Drag the slide bar to set.**

• The speed of the zoom operation varies depending on the position you touch.



[▲]/[▼]	changes the setting slowly
[▲▲]/[▼▼]	changes the setting quickly

5 **Stop recording.**

Setting the recording method of time code

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

Time code represents the recording time by the units of hour, minute, second and frame, and can be used as a time scale for editing motion pictures. This unit automatically records time code during motion picture recording.

- Time codes are not recorded on motion pictures recorded when the [Rec Mode] is set to [MP4].



1 **Select [Time Code] in the [Motion Picture] menu.** (P37)

2 **Press ▲/▼ to select the item and then press [MENU/SET].**

Settings	Description of settings
[Time Code Display]	Set whether or not the time code is displayed on the recording screen/playback screen. **[ON]/[OFF]**
[Count Up]	Sets the time code count method. **[REC RUN]:** Counts the time code only when recording motion pictures. **[FREE RUN]:** Counts the time code even when not recording (including when this unit is turned off).
[Time Code Value]	Sets the start point (starting time) for the time code. **[Reset]:** Sets to 00:00:00:00 (hour: minute: second: frame) **[Manual Input]:** Manually input hour, minute, second and frame. **[Current Time]:** Sets hour, minute and second to current time and sets frame to 00.
[Time Code Mode]	Sets the time code recording method. **[DF] (Drop frame):** The camera modifies the difference between recorded time and time code. This method is used for producing TV programs and other situations where an exact time period needs to be recorded. **[NDF] (Non-drop frame):** Records the time code without drop frame. Used in image production, etc. • When [FHD/24p] or [FHD/24p/ ▮] is set, [Time Code Mode] is fixed to [NDF].

Using the [Motion Picture] Menu

For details on [Motion Picture] menu settings, refer to P37.

- [Photo Style], [Metering Mode], [i.Dynamic], [i.Resolution] and [Digital Zoom] are common to both the [Rec] menu and [Motion Picture] menu. Changing these settings in one of these menus is reflected in other menu.
 - For details, refer to the explanation for the corresponding setting in the [Rec] menu.
- [Motion Picture] menu is not displayed in the following cases.
 - [Glistening Water]/[Glittering Illuminations]/[Soft Image of a Flower] (Scene Guide Mode)
 - [Soft Focus]/[Star Filter] (Creative Control Mode)

[Rec Mode]

- Refer to P177 for details.

[Rec Quality]

- Refer to P177 for details.

[Exposure Mode]

Settings: [P]/[A]/[S]/[M]

- Refer to P184 for details.

[Frame Rate]

Settings: [OFF]/[40%]/[48%]/[80%]/[160%]/[200%]/[300%]

- Refer to P185 for details.

[Picture Mode]

Settings: [] (Motion picture priorities)/[] (Still picture priorities)

- Refer to P183 for details.

[Continuous AF]

Settings: [ON]/[OFF]

• Refer to P180 for details.

[Time Code]

Settings: [Time Code Display]/[Count Up]/[Time Code Value]/[Time Code Mode]

• Refer to P187 for details.

[Rec Highlight]

Applicable modes: P A S M C1 C2 C3

White saturated areas appear blinking in black and white.

Settings: [ON]/[OFF]

• If there are any white saturated areas, we recommend compensating the exposure towards negative (P133) referring to the histogram (P57) and then taking the picture. It may result in a better quality picture.

[Ex. Tele Conv.]

Settings: [ON]/[OFF]

• Refer to P119 for details.

[Flkr Decrease]

Applicable modes: P A S M C1 C2 C3

The shutter speed can be fixed to reduce the flicker or striping in the motion picture.

Settings: [1/50]/[1/60]/[1/100]/[1/120]/[OFF]

[Silent Operation]

Settings: [ON]/[OFF]

• Refer to P186 for details.

[Mic Level Disp.]

Applicable modes: iA iA+ P A S M M C1 C2 C3 SCN

Set whether or not the mic levels are displayed on the screen.

Settings: [ON]/[OFF]

• Not available with [Miniature Effect] in Creative Control Mode.

[Mic Level Adj.]

Applicable modes: iA iA+ P A S M M C1 C2 C3 SCN

Adjust the sound input level to 19 different levels.

• Not available with [Miniature Effect] in Creative Control Mode.

[Special Mic.]

Applicable modes: iA iA+ P A S M M C1 C2 C3 SCN

Settings: [STEREO]/[SHOTGUN]

• Refer to P267 for details.

[Headphone Sound]

Settings: [REAL TIME]/[REC SOUND]

• Refer to P182 for details.

[Wind Cut]

Applicable modes: iA iA+ P A S M C1 C2 C3 SCN

Reduces the wind noise effectively if there is wind noise when recording sound.

Settings: [AUTO]/[HIGH]/[STANDARD]/[LOW]/[OFF]

• Setting [Wind Cut] may alter the usual sound quality.
• Not available with [Miniature Effect] in Creative Control Mode.
• When an external microphone is connected, [AUTO] is not available.

Using the [Playback] Menu

For details on [Playback] menu settings, refer to P37.

With this menu, you can use various playback functions such as cropping and other editing of recorded images, protect settings, etc.

- With [Text Stamp], [Resize] or [Cropping], a new edited picture is created. A new picture cannot be created if there is no free space on the card so we recommend checking that there is free space before editing the picture.

[2D/3D Settings]

Playback methods for the 3D pictures can be switched.

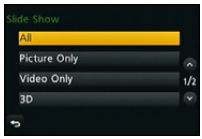
- This is a menu that is only displayed when 3D display is possible. Refer to P248 for details.

[Slide Show]

You can play back the pictures you have taken in synchronisation with music, and you can do this in sequence while leaving a fixed interval between each of the pictures.
You can also put together a slide show composed of only still pictures, only motion pictures, only 3D pictures etc.
We recommend this feature when you view your pictures by connecting the camera to a TV.

1 **Select [Slide Show] on the [Playback] menu. (P37)**

2 **Select the group to play back by pressing ▲/▼, and then press [MENU/SET].**
- Refer to P248 for the method to play back [3D] pictures in 3D.
- During [Category Selection], press ▲/▼/◀/► to select a category, and then press [MENU/SET]. Refer to P194 for category details.



3 **Press ▲ to select [Start] and then press [MENU/SET].**

Operations performed during slide show

Display at the right of the screen while playing back corresponds to ▲/▼/◄/► on the cursor button.

▲	▶/❚❚	Play/Pause	▼	■	Exit slide show
◄	⏮	Back to previous picture (while pausing/playing back motion pictures/playing back group pictures)	►	⏭	Ahead to next picture (while pausing/playing back motion pictures/playing back group pictures)
Control dial (left)	−	Reduce volume level	**Control dial (right)**	+	Increase volume level

• Normal playback resumes after the slide show finishes.

Changing the slide show settings

You can change the settings for slide show playback by selecting [Effect] or [Setup] on the slide show menu screen.

[Effect]

This allows you to select the screen effects when switching from one picture to the next.

[AUTO], [NATURAL], [SLOW], [SWING], [URBAN], [OFF]

• When [URBAN] has been selected, the picture may appear in black and white as a screen effect.
• [AUTO] can be used only when [Category Selection] has been selected. The pictures are played back with the recommended effects in each category.
• [Effect] is fixed to [OFF] when in [Video Only] or during the slide show for [], [] in [Category Selection].
• Even if [Effect] is set, it does not work during a slide show of Group Pictures.
• Some [Effect] will not operate when playing back pictures displayed vertically.

[Setup]

[Duration] or [Repeat] can be set.

Item	Settings	
[Duration]	[1SEC]/[2SEC]/[3SEC]/[5SEC]	
[Repeat]	[ON]/[OFF]	
[Sound]	[AUTO]:	Music is played when the still pictures are played back, and audio is played when the motion pictures are played back.
	[Music]:	Music is played back.
	[Audio]:	Audio (only for motion pictures) is played back.
	[OFF]:	There will be no sound.

• [Duration] can be set only when [OFF] has been selected as the [Effect] setting.
• Even if [Duration] is set, it does not work during a slide show of motion pictures only or slide show of Group Pictures.

[Playback Mode]

Playback in [Normal Play], [Picture Only], [Video Only], [3D Play], [Category Play] or [Favorite Play] can be selected.

1 Select [Playback Mode] on the [Playback] menu. (P37)

2 Select the group to play back by pressing ▲/▼, and then press [MENU/SET].

- Refer to P248 for the method to play back [3D Play] pictures in 3D.

When [Category Play] is selected in above step *2*

3 Press ▲/▼/◄/► to select the category and then press [MENU/SET] to set.

- Pictures are sorted into the categories shown below.

	Recording information e.g. Scene Detection or Scene Guide Modes
	• [Face Recog.]*
	• [i-Portrait], [i-Night Portrait], [i-Baby] in Scene Detection • [Clear Portrait]/[Silky Skin]/[Backlit Softness]/[Clear in Backlight]/[Relaxing Tone]/[Sweet Child's Face]/[Clear Night Portrait] (Scene Guide Mode)
	• [i-Scenery], [i-Sunset] in Scene Detection • [Distinct Scenery]/[Bright Blue Sky]/[Romantic Sunset Glow]/[Vivid Sunset Glow]/[Glistening Water] (Scene Guide Mode)
	• [i-Night Portrait], [i-Night Scenery] in Scene Detection • [Clear Nightscape]/[Cool Night Sky]/[Warm Glowing Nightscape]/[Artistic Nightscape]/[Glittering Illuminations]/[Clear Night Portrait] (Scene Guide Mode)
	• [Clear Sports Shot] (Scene Guide Mode)
	• [Appetizing Food]/[Cute Dessert] (Scene Guide Mode)
	• [Travel Date]
	Still pictures recorded continuously with burst speed set to [SH]
	Pictures taken in [Time Lapse Shot]

* Press ▲/▼/◄/► to select the person to play back and then press [MENU/SET]. Grouped pictures are treated as a single picture with a recognized face.

- Categorisation of the motion pictures differ from the still pictures depending on the Recording Mode. Some motion pictures may not be played back.

[Location Logging]

The location information (longitude/latitude) acquired by the smartphone/tablet can be sent to the camera and written in images.
Preparation:
Sending location information to the camera from the smartphone/tablet. (P213)

1 Select [Location Logging] on the [Playback] menu. (P37)

2 Press ▲/▼ to select [Add Location Data] and then press [MENU/SET].

3 Press ▲/▼ to select the period you intend to record location information on pictures, then press [MENU/SET].

- Confirmation screen is displayed. It is executed when [Yes] is selected.
- The location information is recorded onto images.
- Images with location information are indicated with [GPS].

■ To pause the recording of location information

Press [MENU/SET] while recording of the location information onto pictures is taking place.
- During a suspended period, [●] is displayed.
 Select the period with [●] to restart the recording process from the picture you left off.

■ To delete the received location information

1 **Select [Location Logging] on the [Playback] menu. (P37)**
2 **Press ▲/▼ to select [Delete Location Data] and then press [MENU/SET].**
3 **Press ▲/▼ to select the period you want to delete, then press [MENU/SET].**
- Confirmation screen is displayed. It is executed when [Yes] is selected.

- Location information can be written only to images taken on this camera.
- Location information is not written onto the images that are recorded after [Send location data]. (P213)
- Location information is not written onto the images recorded when [Rec Mode] is set to [AVCHD].
- When there is insufficient free space on the card, location information might not be able to be written.
- When the card is locked, location information cannot be written onto the images or received location information cannot be deleted.

[Title Edit]

You can add text (comments) to pictures. After text has been registered, it can be stamped in prints using [Text Stamp] (P197).

1 Select [Title Edit] on the [Playback] menu. (P37)

2 Press ▲/▼ to select [Single] or [Multi] and then press [MENU/SET].

3 Select the picture, and then press [MENU/SET] to set.

- [✎] is displayed for pictures with titles already registered.

[Multi] setting

❶ Select the picture, and then press [MENU/SET] to set (repeat).
- The setting is canceled when [MENU/SET] is pressed again.

❷ Press ◄ to select [OK], and then press [MENU/SET] to execute.

[Single]



Press ◄/► to select the picture.

[Multi]



Press ▲/▼/◄/► to select the pictures.

4 Enter the text. (P64)

- A maximum of 30 characters can be entered.
- Up to 15 characters can be entered for [＼], [「], [」], [・] and [—].
- Exit the menu after it is set.

- To delete the title, erase all the text in the text input screen.
- You can print out texts (comments) using the “PHOTOfunSTUDIO” bundled software on the CD-ROM (supplied).
- You can set up to 100 pictures at one time with [Multi].
- You cannot use [Title Edit] for the following pictures.
 - Motion pictures
 - Pictures taken with [RAW], [RAW] or [RAW]
 - Pictures recorded with other equipment

[Text Stamp]

You can stamp the recording date/time, name, location, travel date or title onto the recorded pictures.

1 **Select [Text Stamp] on the [Playback] menu.** (P37)

2 **Press ▲/▼ to select [Single] or [Multi] and then press [MENU/SET].**

3 **Select the picture, and then press [MENU/SET] to set.**

- [✓] appears on screen if the picture is stamped with text.

[Multi] setting

❶ Select the picture, and then press [MENU/SET] to set (repeat).
- The setting is canceled when [MENU/SET] is pressed again.

❷ Press ◄ to select [OK], and then press [MENU/SET] to execute.

[Single]



Press ◄/► to select the picture.

[Multi]



Press ▲/▼/◄/► to select the pictures.

4 **Press ▲/▼ to select [Set], and then press [MENU/SET].**

5 **Press ▲/▼ to select text stamp items, and then press [MENU/SET].**

6 **Press ▲/▼ to select the settings, and then press [MENU/SET].**

Item	Description of settings	
[Shooting Date]	[W/O TIME]:	Stamp the year, month and date.
	[WITH TIME]:	Stamp the year, month, day, hour and minutes.
	[OFF]	
[Name]	[👤]: ([Face Recognition])	Name registered in [Face Recog.] will be stamped.
	[👶/🐕]: ([Baby/Pet])	Name registered in [Profile Setup] will be stamped.
	[OFF]	
[Location]	[ON]:	Stamps the travel destination name set under [Location].
	[OFF]	
[Travel Date]	[ON]:	Stamps the travel date set under [Travel Date].
	[OFF]	
[Title]	[ON]:	Title input in the [Title Edit] will be stamped.
	[OFF]	

7 **Press [🗑/↩].**

8 **Press ▲ to select [OK], and then press [MENU/SET].**

- Confirmation screen is displayed. It is executed when [Yes] is selected. Exit the menu after it is executed.

- When you print pictures stamped with text, the date will be printed over the stamped text if you specify printing of the date at the photo shop or on the printer.
- You can set up to 100 pictures at one time in [Multi].
- The picture quality may deteriorate when text stamping is carried out.
- Depending on the printer being used, some characters may be cut at printing. Check before printing.
- When you stamp pictures in a group, the stamped ones are saved separately from the original ones in the group.
- You cannot use [Text Stamp] for the following pictures.
 - Motion pictures
 - Pictures recorded without setting the clock and title
 - Pictures stamped with [Text Stamp]
 - Pictures taken with [RAW+], [RAW+] or [RAW]
 - Pictures recorded with other equipment

[Video Divide]

Recorded motion picture can be divided in two. It is recommended for when you want to divide a part you need with a part you do not need.

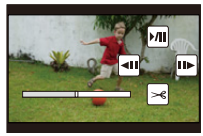
Dividing a motion picture is permanent. Decide before you divide!

1 **Select [Video Divide] on the [Playback] menu.** (P37)

2 **Press ◄/► to select the motion picture to divide, and then press [MENU/SET].**

3 **Press ▲ at the location to divide.**

- Motion picture is played back from the same location when ▲ is pressed again.
- You can finely adjust the location for division by pressing ◄/► while the motion picture is paused.



4 **Press ▼.**

- Confirmation screen is displayed. It is executed when [Yes] is selected. Exit the menu after it is executed.
- Motion picture may be lost if the card or battery is removed while processing the dividing.

- The [Video Divide] feature only works on motion pictures recorded on this camera.
- Motion pictures cannot be divided at a location close to the start or end of the motion picture.
- If you divide a [MP4] or [MOV] motion picture, the display order of images changes. It is recommended to search these motion pictures by using Calendar Playback (P77) or [Video Only] in the [Playback Mode].
- You cannot use [Video Divide] for the following pictures.
 – Motion pictures with a short recording time

[Resize]

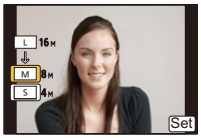
To allow easy posting to web pages, attachment to e-mail etc., picture size (number of pixels) is reduced.

1 **Select [Resize] on the [Playback] menu.** (P37)

2 **Press ▲/▼ to select [Single] or [Multi] and then press [MENU/SET].**

3 **Select the picture and size.**

[Single] setting



❶ Press ◄/► to select the picture, and then press [MENU/SET].
❷ Press ▲/▼ to select the size, and then press [MENU/SET].
- Confirmation screen is displayed. It is executed when [Yes] is selected.
 Exit the menu after it is executed.

[Multi] setting



❶ Press ▲/▼ to select the size, and then press [MENU/SET].
❷ Press ▲/▼/◄/► Select the picture, and then press [MENU/SET] to set (repeat).
- The setting is canceled when [MENU/SET] is pressed again.

❸ Press ◄ to select [OK], and then press [MENU/SET] to execute.
- Confirmation screen is displayed. It is executed when [Yes] is selected.
 Exit the menu after it is executed.

- You can set up to 100 pictures at one time in [Multi].
- The picture quality of the resized picture will deteriorate.
- It may not be possible to resize pictures recorded with other equipment.
- You cannot use [Resize] for the following pictures.
 – Motion pictures
 – Group Pictures
 – Pictures stamped with [Text Stamp]
 – Pictures taken with [RAW], [RAW] or [RAW]

[Cropping]

You can enlarge and then clip the important part of the recorded picture.

1 **Select [Cropping] on the [Playback] menu.** (P37)

2 **Press ◄/► to select the picture, and then press [MENU/SET].**

3 **Use the rear dial and press ▲/▼/◄/► to select the parts to be cropped.**

Rear dial (right): Enlargement
Rear dial (left): Reduction
▲/▼/◄/►: Move

- You can also touch []/[] to enlarge/reduce.
- You can also move by dragging on the screen.

4 **Press [MENU/SET].**

- Confirmation screen is displayed. It is executed when [Yes] is selected. Exit the menu after it is executed.

- The picture quality of the cropped picture will deteriorate.
- Crop one picture at a time. (You cannot edit all pictures in a group at once)
- When you crop pictures in a group, the cropped ones are saved separately from the original ones in the group.
- It may not be possible to crop pictures recorded with other equipment.
- You cannot use [Cropping] for the following pictures.
 – Motion pictures
 – Pictures stamped with [Text Stamp]
 – Pictures taken with [RAW], [RAW] or [RAW]
- Information regarding the Face Recognition in the original picture will not be copied to images having undergone [Cropping].

[Rotate]/[Rotate Disp.]

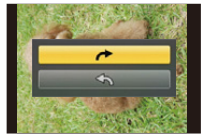
This mode allows you to automatically display pictures vertically if they were recorded holding the camera vertically or rotate pictures manually in 90° steps.

[Rotate] (The picture is rotated manually)

1 **Select [Rotate] on the [Playback] menu.** (P37)
- The [Rotate] function is disabled when [Rotate Disp.] is set to [OFF].

2 **Press ◄/► to select the picture and then press [MENU/SET].**
- The [Rotate] function is disabled for Group Pictures.

3 **Press ▲/▼ to select the direction to rotate the picture and then press [MENU/SET].**



: The picture rotates clockwise in steps of 90°.

: The picture rotates counter-clockwise in steps of 90°.
- Exit the menu after it is set.

[Rotate Disp.] (The picture is automatically rotated and displayed)

1 **Select [Rotate Disp.] on the [Playback] Mode menu.** (P37)

2 **Press ▼ to select [ON] and then press [MENU/SET].**
- The pictures are displayed without being rotated when you select [OFF].
- Exit the menu after it is set.

- When you play back pictures on a PC, they cannot be displayed in the rotated direction unless the OS or software is compatible with Exif. Exif is a file format for still pictures which allows recording information etc. to be added. It was established by “JEITA (Japan Electronics and Information Technology Industries Association)”.
- It may not be possible to rotate pictures that have been recorded with other equipment.
- [Rotate Disp.] is disabled during Multi Playback.

[Favorite]

You can do the following if a mark has been added to pictures and they have been set as favorites.

- Play back the pictures set as favorites only as a slide show.
- Play back only the pictures set as favorites. ([Favorite Play])
- Delete all the pictures not set as favorites. ([All Delete Except Favorite])

1 **Select [Favorite] on the [Playback] menu.** (P37)

2 **Press ▲/▼ to select [Single] or [Multi] and then press [MENU/SET].**

3 **Select the picture, and then press [MENU/SET].**

- If [MENU/SET] is pressed again, the favorite setting is canceled.
- Exit the menu after it is set.

[Single]



Press ◄/► to select the picture.

[Multi]



Press ▲/▼/◄/► to select the pictures.

■ Canceling all the [Favorite] settings

1 **Select [Favorite] on the [Playback] menu.**

2 **Press ▲/▼ to select [Cancel] and then press [MENU/SET].**

- Confirmation screen is displayed. It is executed when [Yes] is selected. Exit the menu after it is executed.
- In [Playback Mode] the [Cancel] Mode is disabled.

- You can set up to 999 pictures as favorites.
- When you set pictures in a group as [Favorite], the number of your [Favorite] pictures is displayed on the [Favorite] icon of the group's top picture.
- You may not be able to set pictures taken with other equipment as favorites.
- You cannot use [Favorite] for the following pictures.
 – Pictures taken with [RAW]

[Print Set]

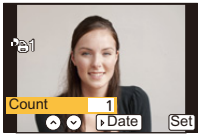
DPOF “Digital Print Order Format” is a system that allows the user to select which pictures to print, how many copies of each picture to print and whether or not to print the recording date on the pictures when using a DPOF compatible photo printer or photo printing store. For details, ask at your photo printing store.
For more information visit:
http://panasonic.jp/dc/dpof_110/white_e.htm
When you set [Print Set] for a group pictures, the print setting for the number of prints will be applied to every picture in the group.

1 **Select [Print Set] on the [Playback] menu.** (P37)

2 **Press ▲/▼ to select [Single] or [Multi] and then press [MENU/SET].**

3 **Select the picture, and then press [MENU/SET].**

[Single]



Press ◄/► to select the picture.

[Multi]



Press ▲/▼/◄/► to select the pictures.

4 **Press ▲/▼ to set the number of prints, and then press [MENU/SET] to set.**

- When [Multi] has been selected
 - –repeat steps ***3*** and ***4*** for each picture. (It is not possible to use the same setting for a multiple number of pictures.)
- [999+] is displayed on the screen, if the total number of prints you set for a group pictures is more than 1000 pictures.
- Exit the menu after it is set.

■ Canceling all the [Print Set] settings

1 **Select [Print Set] on the [Playback] menu.**

2 **Press ▲/▼ to select [Cancel] and then press [MENU/SET].**

- Confirmation screen is displayed. It is executed when [Yes] is selected. Exit the menu after it is executed.

■ To print the date

After setting the number of prints, set/cancel printing with the recording date by pressing ►.

- Depending on the photo printing store or the printer, the date may not be printed even if you set to print the date. For further information, ask at your photo printing store or refer to the operating instructions for the printer.
- The date print feature is disabled for pictures that are stamped with text.

- The number of prints can be set from 0 to 999.
- Depending on the printer, the date print settings of the printer may take precedence so check if this is the case.
- It may not be possible to use the print settings with other equipment. In this case, cancel all the settings, and reset the settings.
- When you set pictures in a group to [Print Set], the number of pictures added to [Print Set] and the total number of pictures to be printed are displayed on the [Print Set] icon of the group's top picture.
- You cannot use [Print Set] for the following pictures.
 – Motion pictures
 – Pictures taken with [RAW]
- If the file is not based on the DCF standard, the DPOF print setting cannot be set.

[Protect]

You can set protection for pictures you do not want to delete by mistake.

1 **Select [Protect] on the [Playback] menu.** (P37)

2 **Press ▲/▼ to select [Single] or [Multi] and then press [MENU/SET].**

3 **Select the picture, and then press [MENU/SET].**
- The settings are canceled when [MENU/SET] is pressed again.
- Exit the menu after it is set.

[Single]



Press ◄/► to select the picture.

[Multi]



Press ▲/▼/◄/► to select the pictures.

■ Canceling all the [Protect] settings

1 **Select [Protect] on the [Playback] menu.**

2 **Press ▲/▼ to select [Cancel] and then press [MENU/SET].**
- Confirmation screen is displayed. It is executed when [Yes] is selected. Exit the menu after it is executed.

- The [Protect] feature is only designed to work with this camera.
- Even if you protect pictures on a card, they will be deleted if the card is formatted.
- Even if you do not protect pictures on a card, they cannot be deleted when the card's Write-Protect switch is set to [LOCK].
- When you set pictures in a group to [Protect], the number of pictures with the [Protect] setting is displayed on the [Protect] icon of the group's top picture.

[Face Rec Edit]

You can clear and replace all information relating to face recognition in selected images.

1. **Select [Face Rec Edit] on the [Playback] menu.** (P37)
2. **Press ▲/▼ to select [REPLACE] or [DELETE] and then press [MENU/SET].**
3. **Press ◄/► to select the picture and then press [MENU/SET].**
4. **Press ◄/► to select the person and then press [MENU/SET].**
5. **(When [REPLACE] is selected) Press ▲/▼/◄/► to select the person to replace and then press [MENU/SET].**
 - Confirmation screen is displayed. It is executed when [Yes] is selected.
 Exit the menu after it is executed.

- Cleared information regarding the [Face Recog.] cannot be restored.
- When all Face Recognition information in a picture has been canceled, the picture will not be categorized using Face Recognition in [Category Play].
- The Face Recognition information of pictures in a group has to be edited at once. (You cannot edit one picture at a time.)

Wi-Fi® function

Use the camera as a wireless LAN device

When using equipment or computer systems that require more reliable security than wireless LAN devices, ensure that the appropriate measures are taken for safety designs and defects for the systems used. Panasonic will not take any responsibility for any damage that arises when using the camera for any purpose other than as a wireless LAN device.

Use of the Wi-Fi function of this camera is presumed to be in countries where this camera is sold

There is the risk that the camera violates the radiowave regulations if used in countries other than those where this camera is sold, and Panasonic takes no responsibility for any violations.

There is the risk that data sent and received via radio waves may be intercepted

Please note that there is the risk that data sent and received via radio waves may be intercepted by a third party.

Do not use the camera in areas with magnetic fields, static electricity or interference

- Do not use the camera in areas with magnetic fields, static electricity or interference, such as near microwave ovens. Radio waves may not reach the camera.
- Using the camera near devices such as microwave ovens or cordless telephones that use the 2.4 GHz radio wave band may cause a decrease in performance in both devices.

Do not connect to the wireless network you are not authorized to use

When the camera utilizes its Wi-Fi function, wireless networks will be searched automatically. When this happens, wireless networks that you are not authorized to use (SSID*) may be displayed, however do not attempt to connect to the network as it may be considered as unauthorized access.

* SSID refers to the name that is used to identify a network over a wireless LAN connection. If the SSID matches for both devices, transmission is possible.

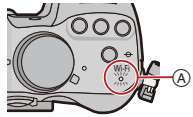
Images that can be sent

Images to send	Destination						
	[Smart phone]	[PC]	[Cloud Sync. Service]	[Web service]	[AV device]		[Printer]*1
					[Home]	[External]	
JPEG	○	○	○	○	○	○	○
RAW+JPEG	—	○	—	—	—	—	—
RAW	—	○	—	—	—	—	—
MP4*1	○	○	○	○	—	—	—
AVCHD*1, 2	—	○	—	—	—	—	—
MOV*1	—	○	—	—	—	—	—
3D	—	○	○	○	○	○	—

*1 Sending by [Send Images While Recording] is not available.
*2 Long AVCHD motion pictures may not be sent.
- Some images may not be played back or sent depending on the device.
- Refer to the manual of the destination equipment or the WEB service for more information on how to playback pictures.

About the Wi-Fi connection lamp

Ⓐ Wi-Fi connection lamp



Lit blue: The Wi-Fi connection is on standby

Blinking blue: Sending/receiving data through the Wi-Fi connection

Before Use

- To use the Wi-Fi function on this unit, a wireless access point or a destination device equipped with the wireless LAN function is required.

- The camera cannot be used to connect to a public wireless LAN connection.
- Use a IEEE802.11b, IEEE802.11g or IEEE802.11n compatible device when using a wireless access point.
- We strongly recommend that you set an encryption to maintain information security.
- It is recommended to use a fully charged battery when sending images.
- When the battery indicator is flashing red, the connection with other equipment may not start or the connection may be disrupted. (A message such as [Communication error] is displayed.)
- When sending images on a mobile network, high packet communication fees may be incurred depending on the details of your contract.
- Pictures may not be completely sent depending on radio wave conditions. If the connection is terminated while sending pictures, pictures with missing sections may be sent.
- **Do not remove the memory card or battery or move to an area without any reception while sending images.**
- The monitor display may become distorted for an instant while connected to the service, however this will not affect the image being sent.

What you can do with the Wi-Fi function

Linking with the Wi-Fi compatible equipment allows you to remotely operate the camera, or share pictures with people in distant places even during recording or playing back.

[Remote Shooting] (P211)	[Playback on TV] (P220)
	
Linking with a smartphone/tablet enables the following: • Remote recording (P213) • Playing back the pictures in the camera (P213) • Saving the pictures in the camera to the smartphone/tablet, or sending them to WEB services. (P213) • Sending the acquired location information to the camera. (P213)	**By linking with the DLNA compatible TV, you can display pictures on TV right after taking them or display them on TV later by playing them back on the camera.**
[Send Images While Recording] (P222)	**[Send Images Stored in the Camera] (P231)**
	
Every time you take a picture, the picture can be automatically sent to a specified location. You can play back the picture on the smartphone/tablet, or save and edit it on PC. • **Send to:** – [Smartphone]/[PC]/[Cloud Sync. Service]/[Web service]/[AV device]	**You can select and send recorded images.** • **Send to:** – [Smartphone]/[PC]/[Cloud Sync. Service]/[Web service]/[AV device]/[Printer]

[Remote Shooting]

You can remotely operate the camera using a smartphone/tablet.
You need to install “LUMIX LINK” on your smartphone/tablet.

Installing the smartphone/tablet app “LUMIX LINK”

The “LUMIX LINK” is an application provided by Panasonic that allows your smartphone/tablet to perform the following operations of a Wi-Fi-compatible LUMIX.

	For Android™ apps	For iOS apps
Version	**2.1 (As of October 2012)**	
OS	**Android 2.2~Android 4.0***	**iOS 4.3~iOS 6.0**
Installation procedure	**1 Connect your Android device to a network.** **2 Select “Google Play™ Store”.** **3 Enter “LUMIX LINK” into the search box.** **4 Select “LUMIX LINK” and install it.** • The icon will be added to the menu. 	**1 Connect the iOS device to the network.** **2 Select “App Store℠”.** **3 Enter “LUMIX LINK” into the search box.** **4 Select “LUMIX LINK” and install it.** • The icon will be added to the menu. 

- The service may not be able to be used properly depending on the type of smartphone/tablet being used. For compatible devices, see the following support site.
 http://panasonic.jp/support/global/cs/dsc/ (This Site is English only.)
- When downloading the app on a mobile network, high packet communication fees may be incurred depending on the details of your contract.

* To connect to this unit with [Wi-Fi Direct], Android OS 4.0 or above is required.

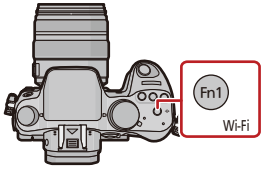
Connecting to a smartphone/tablet

Preparations:

- Install the “LUMIX LINK” in advance. (P211)

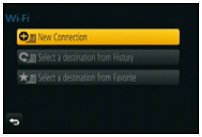
1 Press [Wi-Fi].

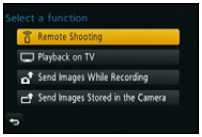
[Wi-Fi]/[Fn1] button can be used in two ways, as [Wi-Fi] or as [Fn1] (function 1). At the time of purchase, it is initially set to [Wi-Fi].
- Refer to P42 for details about the function button.



2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
- When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P214) or [Select a destination from Favorite] (P215).

3 **Press ▲/▼ to select [Remote Shooting], and then press [MENU/SET].**





- The information (SSID and password) required for directly connecting your smartphone/tablet to this unit is displayed.
- To change the connection method, press [DISP.], and then select the connection method. For details, refer to [Change method].



On your smartphone/tablet
(The default connection method is set to [Manual Connection].)

4 **On the setting menu of your smartphone/tablet, turn on the Wi-Fi function.**

5 **Select the SSID that matches the one displayed on the sceen of this unit, and then enter the password.**

6 **Start "LUMIX LINK" on your smartphone/tablet.** (P211)
- When the connection is complete, live images being captured by the camera are displayed on the smartphone/tablet.

■ [Change method]

• When connecting with [Via Network]

(On the camera)

1 **Press ▲/▼ to select [Via Network], and then press [MENU/SET].**

2 **Select the method for connecting to a wireless access point, and set.**
- Refer to P217 for details.

(On your smartphone/tablet)

3 **On the setting menu of your smartphone/tablet, turn on the Wi-Fi function.**

4 **Select the wireless access point you want to connect to, and set.**

5 **Start "LUMIX LINK" on your smartphone/tablet.** (P211)

• When connecting with [Wi-Fi Direct] or [WPS Connection]

(On the camera)

1 **Press ▲/▼ to select [Direct], and then press [MENU/SET].**
- For details on the connection methods, refer to P219.

(On your smartphone/tablet)

2 **Start "LUMIX LINK" on your smartphone/tablet.** (P211)

Taking pictures via a smartphone/tablet (remote recording)

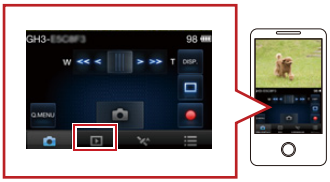
Select [] on the smartphone/tablet.



- Motion pictures are recorded by timer recording. Set the recording time in advance.
- You cannot stop motion picture recording halfway from a smartphone/tablet. To stop the recording, operate the camera.
- A motion picture is not displayed on the screen of the smartphone/tablet during while its recording is taking place.
- The recorded images are saved in the camera.
- Some settings are not available.
- The screen differs depending on the operating system.

Playing back pictures in the camera

Select [] on a smartphone/tablet.



- You can save pictures on the smartphone/tablet.
- You can send pictures to a WEB service, etc.
- The screen differs depending on the operating system.

Sending location information to the camera from a smartphone/tablet

You can acquire location information from a smartphone/tablet, and write it on images afterwards. Refer to P195 for how to write the location information on the images recorded by this unit.

Select [] on a smartphone/tablet.



- The screen differs depending on the operating system.

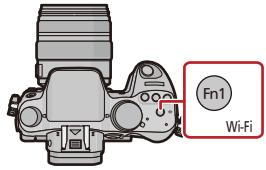
- Read the [Help] in the “LUMIX LINK” menu for further details on how to operate.
- To quit [Remote Shooting], press [Wi-Fi].
- **Caution:**
 Be sure to pay special attention to the privacy, the likeness rights, etc. of the subject when you use this function. Use at your own risk.
- If you have changed the clock setting of this unit or the smartphone/tablet after [Time sync], perform [Time sync] again.
- On the smartphone/tablet, you can set the acquisition interval of location information and check the transfer status of location information. Refer to [Help] in the “LUMIX LINK” menu for details.
- The smartphone/tablet may fail to acquire location information in China and the border area in the neighbouring countries of China. (As of October 2012)
- (When using “LUMIX LINK” for iOS)
 If you press the Home or On/Off button of a smartphone/tablet while [Rec. loc. Info] is working, location information recording is stopped.

[Select a destination from History]

If you want to make a Wi-Fi connection with the setting you used before, you can select it from the history, and connect.

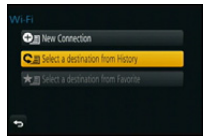
- The number of settings that can be saved in the history is limited. It is recommended that you save frequently used Wi-Fi connection settings in [Select a destination from Favorite]. (P215)
- Performing [Reset Wi-Fi Settings] clears the history and the contents saved in [Select a destination from Favorite].

1 **Press [Wi-Fi].**



2 **Press ▲/▼ to select [Select a destination from History], and then press [MENU/SET].**

3 **Select the desired connection setting with ▲/▼, and then press [MENU/SET].**

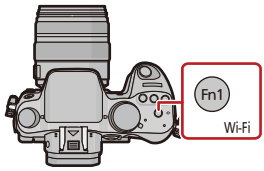


- To display the connection detail, press [DISP.].
- To save the selected connection setting in [Select a destination from History], read steps ***3*** and ***4*** of “Registering to favorites”. (P215)

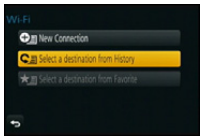
Registering to favorites

If you register a frequently used Wi-Fi connection, you can quickly call it and connect.

1 Press [Wi-Fi].



2 Press ▲/▼ to select [Select a destination from History], and then press [MENU/SET].

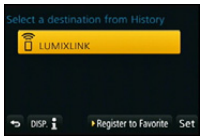


3 Select the item you want to register to favorites with ▲/▼, and then press ►.

- To display the connection detail, press [DISP.].

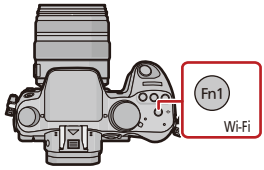
4 Enter a registration name.

- For details on how to enter characters, refer to “Entering Text” section on P64.
- A maximum of 30 characters can be entered.
- Up to 15 characters can be entered for [＼], [「], [」], [・] and [—].



[Select a destination from Favorite]

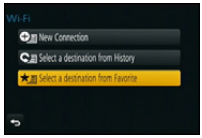
1 Press [Wi-Fi].



2 Press ▲/▼ to select [Select a destination from Favorite], and then press [MENU/SET].

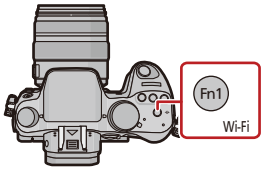
3 Select the desired connection setting with ▲/▼, and then press [MENU/SET].

- To display the connection detail, press [DISP.].
- To edit the items saved in [Select a destination from Favorite], read steps ***3*** and ***4*** of “Editing the items registered to favorites”. (P216)

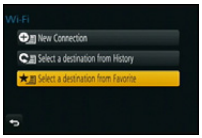


Editing the items registered to favorites

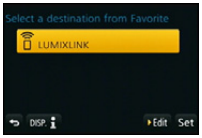
1 **Press [Wi-Fi].**



2 **Press ▲/▼ to select [Select a destination from Favorite], and then press [MENU/SET].**



3 **Select the favorite item you want to edit with ▲/▼, and then press ►.**



4 **Press ▲/▼ to select the item, and press [MENU/SET].**

Item	Description of settings
[Remove from Favorite]	—
[Change the Order in Favorite]	Select the destination with ▲/▼, and then press [MENU/SET].
[Change the Registered Name]	• For details on how to enter characters, refer to “Entering Text” section on P64. • A maximum of 30 characters can be entered. • Up to 15 characters can be entered for [＼], [「], [」], [・] and [—].

Selecting the connection method

• You can select whether to connect via a wireless access point or connect directly.

Connecting via a wireless access point

Press ▲/▼ to select connection method, and then press [MENU/SET].

Connection method	Description of settings	
[WPS (Push-Button)]*	Save push button type wireless access point that is compatible with Wi-Fi Protected Setup™ with a WPS mark.	P217
[WPS (PIN code)]	Save PIN code type wireless access point that is compatible with Wi-Fi Protected Setup with a WPS mark.	P217
[Manual Connection]	Select this option when you are not sure about the WPS compatibility, or when you want to search for and connect to a wireless access point.	P218

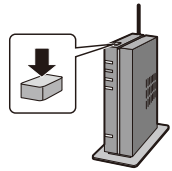
* WPS refers to a function that allows you to easily configure the settings related to the connection and security of wireless LAN devices. To check if the wireless access point you are using is compatible with WPS, refer to the manual of the wireless access point.

When connecting with [WPS (Push-Button)]

Press the wireless access point WPS button until it switches to WPS Mode.

• Refer to the wireless access point instruction manual for details.

e.g.:



When connecting with [WPS (PIN code)]

1. **Press ▲/▼ to select the wireless access point you are connecting to, and press [MENU/SET].**
2. **Enter the PIN code displayed on the camera screen into the wireless access point.**
3. **Press [MENU/SET].**
 • Refer to the wireless access point instruction manual for details.

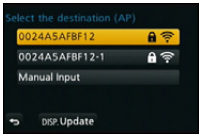
If you are not sure about the WPS compatibility (connecting by [Manual Connection])

Search for available wireless access points.

- Confirm encryption key of the selected wireless access point if the network authentication is encrypted.
- When connecting by [Manual Input], confirm SSID, encryption type, encryption key of the wireless access point you are using.

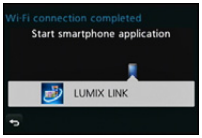
1 Press ▲/▼ to select the wireless access point you are connecting to, and press [MENU/SET].

- Touching [DISP.] will search for a wireless access point again.
- If no wireless access point is found, refer to “When connecting with [Manual Input]” on P218.



2 (If network authentication is encrypted)
Enter the encryption key.

- For details on how to enter characters, refer to “Entering Text” section on P64.



■ When connecting with [Manual Input]

1 On the screen displayed in step *1* of “If you are not sure about the WPS compatibility (connecting by [Manual Connection])”, select [Manual Input] by pressing ▲/▼, then press [MENU/SET].

2 Enter the SSID of the wireless access point you are connecting to, then select [Set].

- For details on how to enter characters, refer to “Entering Text” section on P64.

3 Press ▲/▼ to select the network authentication type, and press [MENU/SET].

- For information on network authentication, see the manual of the wireless access point.

4 Press ▲/▼ to select the encryption type, and press [MENU/SET].

- The type of settings that can be changed may vary depending on the details of network authentication settings.

Network authentication type	Encryption types that can be set
[WPA2-PSK]/[WPA-PSK]	[TKIP]/[AES]
[Common Key]	[WEP]
[Open]	[No Encryption]/[WEP]

5 (When an option other than [No Encryption] is selected)
Enter the encryption key and select [Set].

- Check the wireless access points instruction manual and settings when a saving wireless access point.
- If no connection can be established, the wireless access point's radio waves may be too weak. Refer to "Message Display" (P274) and "Troubleshooting" (P286) for details.
- Transmission speed may decrease, or may not be usable depending on the environment it is used in.

Connecting directly

- Directly connect this unit to the device you are using as a wireless access point. You can connect this unit and your device in a method supported by your device.

Press ▲/▼ to select connection method, and then press [MENU/SET].

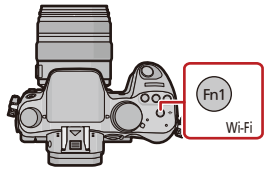
Connection method	Description of settings
[Wi-Fi Direct]™	**1 Set the device to Wi-Fi Direct mode.** **2 Press ▲/▼ to select [Wi-Fi Direct] and then press [MENU/SET].** **3 Press ▲/▼ to select the device to connect to, and then press [MENU/SET].** • Read the operating instructions of your device for details.
[WPS Connection]	**[WPS (Push-Button)]** **1 Press ▲/▼ to select [WPS (Push-Button)] and then press [MENU/SET].** **2 Set the device to WPS mode.** • You can wait longer for a connection by pressing the [DISP.] button on this unit.
	[WPS (PIN code)] **1 Press ▲/▼ to select [WPS (PIN code)] and then press [MENU/SET].** **2 Enter the PIN code of the device into this unit.**
[Manual Connection]	Enter the SSID and password into the device. The SSID and password are displayed on the connection waiting screen of this unit.

[Playback on TV]

Displaying the picture on TV right after taking it/Displaying the picture on TV by playing it back on the camera

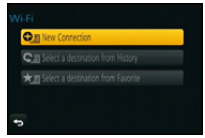
Preparations:
Set the TV to DLNA waiting Mode. • Read the operating instructions for your TV.

1 **Press [Wi-Fi].**

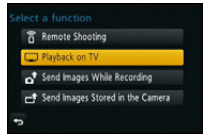


2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**

• When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P214) or [Select a destination from Favorite] (P215).



3 **Press ▲/▼ to select [Playback on TV], and then press [MENU/SET].**



4 **Press ▲/▼ to select connection method, and then press [MENU/SET].**

[Via Network]	When you want to connect to your TV via an wireless access point. (P217)
[Direct]	When you want to directly connect your TV to this unit with [Wi-Fi Direct], [WPS Connection], or [Manual Connection]. (P219)

5 **Press ▲/▼ to select a device you want to connect, and then press [MENU/SET].**

• When the connection is established, the screen is displayed.

6 **Take or play back pictures on this unit.**

• To change the setting or disconnect, press [Wi-Fi]. (P221)

- Motion pictures cannot be displayed on a TV.
- During the multi/calendar playback, pictures displayed on the screen of this unit are not displayed on TV.
- When a TV is connected to this unit, the TV screen may temporarily return to the status before the connection. Pictures are displayed again when you take or play back pictures.
- [Effect] and [Sound] of the Slide Show are disabled.

What you can do with the [Wi-Fi] button when connected to Wi-Fi

1 Press [Wi-Fi] when connected to Wi-Fi.
2 Press ▲/▼ to select the item, and press [MENU/SET].

Item	Description of settings
[Terminate the Connection]	Terminates the Wi-Fi connection.
[Change the Destination]	Terminates the Wi-Fi connection, and allows you to select a different Wi-Fi connection.
[Change Settings for Sending Images]	Refer to P224 for details.
[Register the Current Destination to Favorite]	Registering the current connection destination or the connection method, you can easily connect with the same connection method next time.

[Send Images While Recording]

A picture can be automatically sent to a specified device every time you take it.
Since the camera gives priority to recording, sending may take longer during the recording of Burst pictures or motion pictures.

- Motion pictures cannot be sent.
- If you turn off this unit or the Wi-Fi connection before sending is complete, unsent pictures will not be resent.
- You may not be able to delete files or use the playback menu while sending.
- When sending images on a mobile network, high packet communication fees may be incurred depending on the details of your contract.

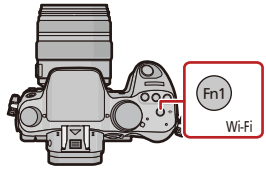
When sending images to smartphone/tablet

Preparations:
• Install the “LUMIX LINK” in advance. (P211)

1 **Press [Wi-Fi].**

2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**

- When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P214) or [Select a destination from Favorite] (P215).



3 **Press ▲/▼ to select [Send Images While Recording], and then press [MENU/SET].**

4 **Press ▲/▼ to select [Smartphone], and then press [MENU/SET].**

5 **Select the connection method.** (P223)

6 **Press ▲/▼ to select a device you want to connect, and then press [MENU/SET].**

- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P224)

7 **Take pictures.**

- The pictures are sent automatically after taking them.
- To change the setting or disconnect, press [Wi-Fi].
 You cannot change the settings while sending pictures. Wait until sending is complete.

Selecting the method for connecting to the smartphone/tablet

■ When you want to connect to the smartphone/tablet via a wireless access point

(On your smartphone/tablet)

1 **On the setting menu of your smartphone/tablet, turn on the Wi-Fi function.**

2 **Select the wireless access point you want to connect to, and set.**

3 **Start "LUMIX LINK" on your smartphone/tablet.**＊ **(P211)**

(On the camera)

4 **Press ▲/▼ to select [Via Network], and then press [MENU/SET].**

5 **Select the method for connecting to a wireless access point, and set.**

- Refer to P217 for details.

■ When you want to directly connect the smartphone/tablet to this unit

• When connecting with [Wi-Fi Direct] or [WPS Connection]

(On the camera)

1 **Press ▲/▼ to select [Direct], and then press [MENU/SET].**

- For details on the connection methods, refer to P219.

(On your smartphone/tablet)

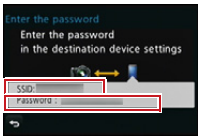
2 **Start "LUMIX LINK" on your smartphone/tablet.**＊ **(P211)**

• When connecting with [Manual Connection]

(On the camera)

1 **Press ▲/▼ to select [Direct], and then press [MENU/SET].**

2 **Press ▲/▼ to select [Manual Connection], and then press [MENU/SET].**



(On your smartphone/tablet)

3 **On the setting menu of your smartphone/tablet, turn on the Wi-Fi function.**

4 **Select the SSID that matches the one displayed on the sceen of this unit, and then enter the password.**

5 **Start "LUMIX LINK" on your smartphone/tablet.**＊ **(P211)**

＊ A window indicating that the smartphone/tablet is connecting to the camera is displayed. If you are using an Android device, press the back key. If you are using an iOS device, close the window.

Changing the settings for sending images

Press ▲/▼ to select the item, and press [MENU/SET].

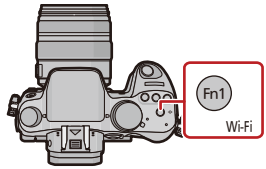
Item	Description of settings
[Size]	Resize the image to send. **[Original]/[Auto]**[*1]**/[Change]** • If you select [Auto], the image size is determined by the circumstances at the destination. • You can select the image size for [Change] from [M], [S] or [VGA]. The aspect ratio does not change.
[File Format]	**[JPG]/[RAW+JPG]/[RAW]**
[Delete Location Data][*2]	Select whether to delete the location information from images before sending them. **[ON]:** Delete the location information, then send. **[OFF]:** Keep the location information and send. • This operation only deletes the location information from the images that are set to be sent. (The location information will not be deleted from the original images stored in this unit.)
[Cloud Limit][*3]	You can select whether to send images when the Cloud Folder runs out of free space. **[ON]:** Do not send images. **[OFF]:** Delete images from the oldest ones, then send new images.

*1 Only available when the destination is set to [Web service].
*2 Only available when [Send Images Stored in the Camera] is selected and the destination is set to [Cloud Sync. Service], [Web service] or [External] of [AV device].
*3 Only available when the destination is set to [Cloud Sync. Service].

When sending images to PC

Preparations:
• Turn the computer on. • Prepare folders for receiving images on the PC before sending a picture to the PC. (P226)

1 **Press [Wi-Fi].**



2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
- When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P214) or [Select a destination from Favorite] (P215).

3 **Press ▲/▼ to select [Send Images While Recording], and then press [MENU/SET].**

4 **Press ▲/▼ to select [PC], and then press [MENU/SET].**

5 **Press ▲/▼ to select connection method, and then press [MENU/SET].**

[Via Network]	When you want to connect to your PC via a wireless access point. (P217)
[Direct]	When you want to directly connect your PC to this unit with [Wi-Fi Direct], [WPS Connection], or [Manual Connection]. (P219)

6 **Press ▲/▼ to select the PC you want to connect to, and then press [MENU/SET].**

7 **Press ▲/▼ to select the folder you want to send, and then press [MENU/SET].**
- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P224)

8 **Take pictures.**
- To change the setting or disconnect, press [Wi-Fi]. (P221)
 You cannot change the settings while sending pictures. Wait until sending is complete.

- Folders sorted by the sent date are created in the specified folder, and pictures are saved in those folders.
- If the screen for a user account and password entry appears, enter the one you set on your PC.

To create a folder that receives images

• Create a PC user account [account name (up to 254 characters) and password (up to 32 characters)] consisting of alphanumeric characters. An attempt to create a receive folder may fail if the account includes non-alphanumeric characters.

■ When using “PHOTOfunSTUDIO”

1 Install “PHOTOfunSTUDIO” to the PC.

- For details on hardware requirements and installation, read “About the supplied software” (P255).

2 Create a folder that receives images with “PHOTOfunSTUDIO”.

- To create the folder automatically, select [Auto-create]. To specify a folder, create a new folder, or set a password to the folder, select [Create manually].
- For details, refer to the operating instructions of “PHOTOfunSTUDIO” (PDF).

■ When not using “PHOTOfunSTUDIO”

(For Windows)
Supported OS: Windows 7/Windows Vista/Windows XP
Example: Windows 7

1 Select a folder you intend to use for receiving, then right-click.

2 Select [Properties], then enable sharing of the folder.

- For details, refer to the operating instructions of your PC or Help on the operating system.

(For Mac)
Supported OS: OS X v10.4 to v10.8
Example: OS X v10.8

1 Select a folder you intend to use for receiving, then click on the items in the following order.

[File] → [Get Info]

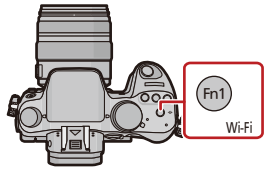
2 Enable sharing of the folder.

- For details, refer to the operating instructions of your PC or Help on the operating system.

When sending images to [Cloud Sync. Service]

Preparations:
You need to register to “LUMIX CLUB” (P239) and configure the Cloud Sync. setting to send a picture to a Cloud Folder.

1 **Press [Wi-Fi].**



2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
- When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P214) or [Select a destination from Favorite] (P215).

3 **Press ▲/▼ to select [Send Images While Recording], and then press [MENU/SET].**

4 **Press ▲/▼ to select [Cloud Sync. Service], and then press [MENU/SET].**

5 **Press ▲/▼ to select connection method, and then press [MENU/SET].** (P217)

6 **Check the send setting.**
- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P224)

7 **Take pictures.**
- To change the setting or disconnect, press [Wi-Fi]. (P221)
 You cannot change the settings while sending pictures. Wait until sending is complete.

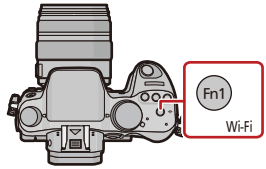
■ About the images sent to a Cloud Folder by the use of [Cloud Sync. Service] (As of October 2012)

To send images to a PC, Cloud Sync. setting is required. Configure the settings on a PC with “PHOTOfunSTUDIO” or on a smartphone/tablet with “LUMIX LINK”.
- If you set the picture destination to [Cloud Sync. Service], sent pictures are temporarily saved in the cloud folder, and they can be synchronized with the device in use, such as the PC or smartphone/tablet.
- A Cloud Folder stores transferred images for 30 days (up to 1000 pictures). Transferred images are deleted automatically 30 days after the transfer. Furthermore, when the number of stored images exceeds 1000, some images may be deleted depending on the [Cloud Limit] (P224) setting even within 30 days after the transfer.
- When the download of images from a Cloud Folder to all specified devices is complete, images may be deleted from the Cloud Folder even within 30 days after the transfer.

When sending images to WEB Service

Preparations:
You need to register to “LUMIX CLUB” (P239) to send a picture to a WEB service. When sending images to WEB services, such as Facebook or YouTube, the WEB service being used must be registered with the “LUMIX CLUB”. Registering multiple WEB services will send images to all services simultaneously. (P242)

1 **Press [Wi-Fi].**



2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
- When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P214) or [Select a destination from Favorite] (P215).

3 **Press ▲/▼ to select [Send Images While Recording], and then press [MENU/SET].**

4 **Press ▲/▼ to select [Web service], and then press [MENU/SET].**

5 **Press ▲/▼ to select connection method, and then press [MENU/SET]. (P217)**

6 **Press ▲/▼/◄/► to select a WEB service you want to connect, and then press [MENU/SET].**
- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P224)

7 **Take pictures.**
- To change the setting or disconnect, press [Wi-Fi]. (P221)
 You cannot change the settings while sending pictures. Wait until sending is complete.

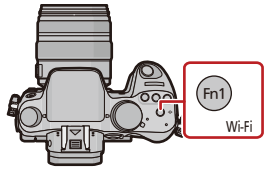
- Images uploaded to the WEB Service cannot be displayed or deleted with this camera. Check images by accessing the WEB Service with your smartphone/tablet or computer.
- If sending images fails, a report email outlining the failure will be sent to the email address registered with “LUMIX CLUB”.
- **Images may contain personal information that can be used to identify the user, such as a title, the time and date when the images was taken, and the location where the image was taken. Check this information before uploading images to WEB services.**

- Panasonic assumes no responsibility for the damages resulting from the leakage, loss, etc. of images uploaded on WEB services.
- When uploading images to the WEB Service, do not delete images from this camera, even after they have finished sending, until you have checked that they have been properly uploaded to the WEB Service. Panasonic assumes no responsibility for the damages resulting from the deletion of images stored in this unit.

When sending images to AV device

Preparations:
When sending a picture to [Home], set your device to DLNA waiting mode. • Read the operating instructions of your device for details. When sending images to [External], the following are required: • Registration to “LUMIX CLUB”. (P239) • Address number and access number acquired by the destination External AV device. (P243)

1 **Press [Wi-Fi].**



2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
- When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P214) or [Select a destination from Favorite] (P215).

3 **Press ▲/▼ to select [Send Images While Recording], and then press [MENU/SET].**

4 **Press ▲/▼ to select [AV device], and then press [MENU/SET].**

5 **Press ▲/▼ to select [Home] or [External], and then press [MENU/SET].**

6 **Press ▲/▼ to select connection method, and then press [MENU/SET].**
- When [External] is selected, the screen for setting a wireless access point is displayed. (P217)

[Via Network]	When you want to connect to an AV device via a wireless access point. (P217)
[Direct]	When you want to directly connect an AV device to this unit with [Wi-Fi Direct], [WPS Connection], or [Manual Connection]. (P219)

7 **Press ▲/▼ to select a device you want to connect, and then press [MENU/SET].**
- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P224)

8 **Take pictures.**
- To change the setting or disconnect, press [Wi-Fi]. (P221)
 You cannot change the settings while sending pictures. Wait until sending is complete.

[Send Images Stored in the Camera]

- When sending images on a mobile network, high packet communication fees may be incurred depending on the details of your contract.
- Details of the playback menu [Favorite] or [Print Set] settings will not be sent.
- Some images taken with a different camera may not be able to be sent.
- Images that have been modified or edited with a computer may not be able to be sent.

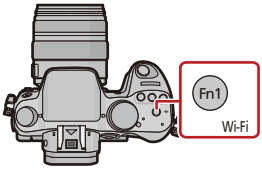
When sending images to smartphone/tablet

Preparations:
• Install the “LUMIX LINK” in advance. (P211)

1 **Press [Wi-Fi].**

2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**

- When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P214) or [Select a destination from Favorite] (P215).



3 **Press ▲/▼ to select [Send Images Stored in the Camera], and then press [MENU/SET].**

4 **Press ▲/▼ to select [Smartphone], and then press [MENU/SET].**

5 **Select the connection method. (below)**

6 **Press ▲/▼ to select a device you want to connect, and then press [MENU/SET].**

- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P224)

7 **Press ▲/▼ to select [Single Select] or [Multi Select] and then press [MENU/SET].**

- To change the setting or disconnect, press [Wi-Fi]. (P221)

8 **Select and send the images. (P232)**

Selecting the method for connecting to the smartphone/tablet

■ When you want to connect to the smartphone/tablet via a wireless access point

(On your smartphone/tablet)

1 **On the setting menu of your smartphone/tablet, turn on the Wi-Fi function.**

2 **Select the wireless access point you want to connect to, and set.**

3 **Start “LUMIX LINK” on your smartphone/tablet.* (P211)**

(On the camera)

4 **Press ▲/▼ to select [Via Network], and then press [MENU/SET].**

5 **Select the method for connecting to a wireless access point, and set.**

- Refer to P217 for details.

■ When you want to directly connect the smartphone/tablet to this unit

• When connecting with [Wi-Fi Direct] or [WPS Connection]

(On the camera)

1 **Press ▲/▼ to select [Direct], and then press [MENU/SET].**

• For details on the connection methods, refer to P219.

(On your smartphone/tablet)

2 **Start "LUMIX LINK" on your smartphone/tablet.*** (P211)

• When connecting with [Manual Connection]

(On the camera)

1 **Press ▲/▼ to select [Direct], and then press [MENU/SET].**

2 **Press ▲/▼ to select [Manual Connection], and then press [MENU/SET].**



(On your smartphone/tablet)

3 **On the setting menu of your smartphone/tablet, turn on the Wi-Fi function.**

4 **Select the SSID that matches the one displayed on the sceen of this unit, and then enter the password.**

5 **Start "LUMIX LINK" on your smartphone/tablet.*** (P211)

* A window indicating that the smartphone/tablet is connecting to the camera is displayed. If you are using an Android device, press the back key. If you are using an iOS device, close the window.

Select and send the images

[Single Select] setting

❶ Press ◄/► to select the picture.

❷ Press [MENU/SET].

• Confirmation screen is displayed. It is executed when [Yes] is selected.

[Multi Select] setting

❶ Select the picture, and then press [MENU/SET] to set (repeat).

• The setting is canceled when [MENU/SET] is pressed again.

❷ Press ◄ to select [OK], and then press [MENU/SET] to execute.

• Confirmation screen is displayed. It is executed when [Yes] is selected.

[Single Select]



Press ◄/► to select the picture.

[Multi Select]



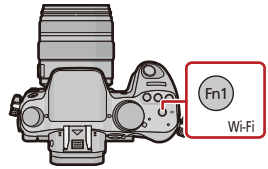
Press ▲/▼/◄/► to select the pictures.

• The number of pictures that can be sent by [Multi Select] is limited.

When sending images to PC

Preparations:
• Turn the computer on. • Prepare folders for receiving images on the PC before sending a picture to the PC. (P226)

1 **Press [Wi-Fi].**



2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
- When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P214) or [Select a destination from Favorite]. (P215)

3 **Press ▲/▼ to select [Send Images Stored in the Camera], and then press [MENU/SET].**

4 **Press ▲/▼ to select [PC], and then press [MENU/SET].**

5 **Press ▲/▼ to select connection method, and then press [MENU/SET].**

[Via Network]	When you want to connect to your PC via a wireless access point. (P217)
[Direct]	When you want to directly connect your PC to this unit with [Wi-Fi Direct], [WPS Connection], or [Manual Connection]. (P219)

6 **Press ▲/▼ to select a PC you want to connect, and then press [MENU/SET].**

7 **Press ▲/▼ to select the folder you want to send, and then press [MENU/SET].**
- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P224)

8 **Press ▲/▼ to select [Single Select] or [Multi Select] and then press [MENU/SET].**
- To change the setting or disconnect, press [Wi-Fi]. (P221)

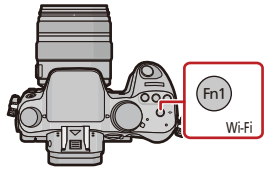
9 **Select and send the images. (P232)**

- Folders sorted by the sent date are created in the specified folder, and pictures are saved in those folders.
- If the screen for a user account and password entry appears, enter the one you set on your PC.

When sending images to [Cloud Sync. Service]

Preparations:
You need to register to “LUMIX CLUB” (P239) and configure the Cloud Sync. setting (P227) to send a picture to a Cloud Folder.

1 **Press [Wi-Fi].**



2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
- When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P214) or [Select a destination from Favorite]. (P215)

3 **Press ▲/▼ to select [Send Images Stored in the Camera], and then press [MENU/SET].**

4 **Press ▲/▼ to select [Cloud Sync. Service], and then press [MENU/SET].**

5 **Press ▲/▼ to select connection method, and then press [MENU/SET]. (P217)**

6 **Check the send setting.**
- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P224)

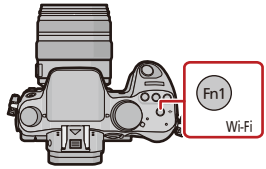
7 **Press ▲/▼ to select [Single Select] or [Multi Select] and then press [MENU/SET].**
- To change the setting or disconnect, press [Wi-Fi]. (P221)

8 **Select and send the images. (P232)**

When sending images to WEB Service

Preparations:
You need to register to “LUMIX CLUB” (P239) to send a picture to a WEB service. When sending images to WEB services, such as Facebook or YouTube, the WEB service being used must be registered with the “LUMIX CLUB”. Registering multiple WEB services will send images to all services simultaneously. (P242)

1 **Press [Wi-Fi].**



2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
- When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P214) or [Select a destination from Favorite]. (P215)

3 **Press ▲/▼ to select [Send Images Stored in the Camera], and then press [MENU/SET].**

4 **Press ▲/▼ to select [Web service], and then press [MENU/SET].**

5 **Press ▲/▼ to select connection method, and then press [MENU/SET]. (P217)**

6 **Press ▲/▼/◄/► to select a WEB service you want to connect, and then press [MENU/SET].**
- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P224)

7 **Press ▲/▼ to select [Single Select] or [Multi Select] and then press [MENU/SET].**
- To change the setting or disconnect, press [Wi-Fi]. (P221)

8 **Select and send the images. (P232)**

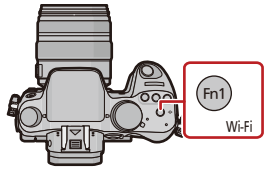
- Images uploaded to the WEB Service cannot be displayed or deleted with this camera. Check images by accessing the WEB Service with your smartphone/tablet or computer.
- If sending images fails, a report email outlining the failure will be sent to the email address registered with “LUMIX CLUB”.
- **Images may contain personal information that can be used to identify the user, such as a title, the time and date when the images was taken, and the location where the image was taken. Check this information before uploading images to WEB services.**

- Panasonic assumes no responsibility for the damages resulting from the leakage, loss, etc. of images uploaded on WEB services.
- When uploading images to the WEB Service, do not delete images from this camera, even after they have finished sending, until you have checked that they have been properly uploaded to the WEB Service. Panasonic assumes no responsibility for the damages resulting from the deletion of images stored in this unit.

When sending images to AV device

Preparations:
When sending a picture to [Home], set your device to DLNA waiting mode. • Read the operating instructions of your device for details. When sending images to [External], the following are required: • Registration to “LUMIX CLUB” (P239) • Address number and access number acquired by the destination External AV device. (P243)

1 **Press [Wi-Fi].**



2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**
- When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P214) or [Select a destination from Favorite]. (P215)

3 **Press ▲/▼ to select [Send Images Stored in the Camera], and then press [MENU/SET].**

4 **Press ▲/▼ to select [AV device], and then press [MENU/SET].**

5 **Press ▲/▼ to select [Home] or [External], and then press [MENU/SET].**

6 **Press ▲/▼ to select connection method, and then press [MENU/SET].**
- When [External] is selected, the screen for setting a wireless access point is displayed. (P217)

[Via Network]	When you want to connect to an AV device via a wireless access point. (P217)
[Direct]	When you want to directly connect an AV device to this unit with [Wi-Fi Direct], [WPS Connection], or [Manual Connection]. (P219)

7 **Press ▲/▼ to select a device you want to connect, and then press [MENU/SET].**
- When the connection is complete, the screen is displayed. To change the send setting, press [DISP.]. (P224)

8 **Press ▲/▼ to select [Single Select] or [Multi Select] and then press [MENU/SET].**
- To change the setting or disconnect, press [Wi-Fi]. (P221)

9 **Select and send the images. (P232)**

When sending images to Printer

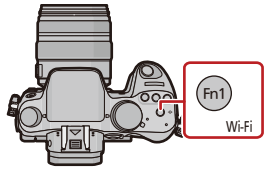
Preparations:

- You can print out recorded pictures wirelessly from a PictBridge (wireless LAN-compatible)* printer.

* Compliant with the DPS over IP standards.

See the following website for information on the PictBridge (wireless LAN-compatible) printer.
http://panasonic.jp/support/global/cs/dsc/ (This Site is English only.)

1 **Press [Wi-Fi].**



2 **Press ▲/▼ to select [New Connection], and then press [MENU/SET].**

- When connecting with the setting you used before, you can select the connection destination from [Select a destination from History] (P214) or [Select a destination from Favorite] (P215).

3 **Press ▲/▼ to select [Send Images Stored in the Camera], and then press [MENU/SET].**

4 **Press ▲/▼ to select [Printer], and then press [MENU/SET].**

5 **Press ▲/▼ to select connection method, and then press [MENU/SET].**

[Via Network]	When you want to connect to your Printer via a wireless access point. (P217)
[Direct]	When you want to directly connect your printer to this unit with [Wi-Fi Direct], [WPS Connection], or [Manual Connection]. (P219)

6 **Press ▲/▼ to select a printer you want to connect, and then press [MENU/SET].**

7 **Select pictures, and then print. (P261)**

- To change the setting or disconnect, press [Wi-Fi]. (P221)

- Motion pictures cannot be printed out.

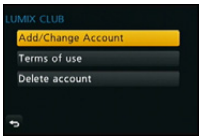
Using “LUMIX CLUB”

About the [LUMIX CLUB]

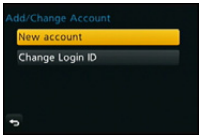
Acquire a “LUMIX CLUB” login ID (free).
If you register this unit to the “LUMIX CLUB”, you can synchronize images between the devices you are using, or transfer these images to WEB services.
Use the “LUMIX CLUB” when uploading pictures to WEB services or external AV device.
• You can set the same “LUMIX CLUB” login ID for this unit and a smartphone/tablet. (P241)

Refer to the “LUMIX CLUB” site for details.
http://lumixclub.panasonic.net/eng/c/

1 **Select [Wi-Fi] in the [Setup] menu.** (P37)
2 **Select [Wi-Fi Setup] in the [Wi-Fi] menu.**
3 **Press ▲/▼ to select [LUMIX CLUB], and press [MENU/SET].**
4 **Press ▲/▼ to select [Add/Change Account], and press [MENU/SET].**

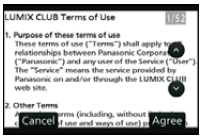


5 **Press ▲/▼ to select [New account], and press [MENU/SET].**
- Connect to the network. Proceed to the next page by pressing [MENU/SET].
- A confirmation screen will be displayed if a login ID has already been acquired for the camera. Select [Yes] to acquire a new login ID, or [No] if you do not need to acquire a new login ID.



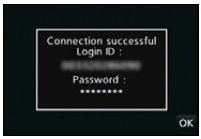
6 **Select the method for connecting to a wireless access point, and set.**
- Refer to P217 for details.

7 **Read through the “LUMIX CLUB” terms of use and press [MENU/SET].**
- You can switch pages by ▲/▼.
- You can enlarge (2×) the display by rotating the rear dial to the right.
- You can reset the enlarged display to its original size (1×) by rotating the rear dial to the left.
- You can move the position of the enlarged display with ▲/▼/◀/▶.
- Press [🗑/↩] to cancel the process without acquiring a login ID.



8 **Enter a password and press [MENU/SET].**
- Enter any combination of 8 to 16 characters and numbers for the password.
- For details on how to enter characters, refer to “Entering Text” section on P64.

9 Check the login ID and press [MENU/SET].



- The login ID (12-digit number) will be displayed automatically. When logging in to the "LUMIX CLUB" with a computer, you only need to enter the numbers.
- A message is displayed when the connection is complete. Press [MENU/SET].
- **Be sure to make a note of the login ID and password.**

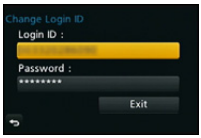
Check or change the acquired login ID/password

Preparation:
To change the "LUMIX CLUB" password on the camera, access the "LUMIX CLUB" website from your smartphone/tablet or PC and change the "LUMIX CLUB" password in advance.

1 Select [Wi-Fi] in the [Setup] menu. (P37)
2 Select [Wi-Fi Setup] in the [Wi-Fi] menu.
3 Press ▲/▼ to select [LUMIX CLUB], and press [MENU/SET].
4 Press ▲/▼ to select [Add/Change Account], and press [MENU/SET].
5 Press ▲/▼ to select [Change Login ID], and press [MENU/SET].

- The login ID and password are displayed.
- The password is displayed as "✱".
- Close the menu if only checking the login ID.

6 Press ▲/▼ to select the login ID or password you want to change, and press [MENU/SET].



- The confirmation screen is displayed when changing the login ID. Select [Yes].

7 Enter the login ID or password, and press [MENU/SET].

- Refer to "Entering Text" (P64) for information on how to enter text.
- Enter the new password you have created on your smartphone/tablet or PC into the camera. If the password differs from the one you created on your smartphone/tablet or PC, you will not be able to upload images.
- Close the menu after changing settings.

To set the same login ID for the camera and the smartphone/tablet

• Setting the same login ID on this unit and your smartphone/tablet is convenient for sending images on this unit to other devices or WEB services.

When either this unit or the smartphone/tablet has acquired the login ID:

1 **Connect this unit to the smartphone/tablet.** (P211)
2 **From the "LUMIX LINK" menu, set the common login ID.**
 • The login IDs for this unit and the smartphone/tablet become the same.

• After connecting this unit to the smartphone/tablet, the setup screen for a common login ID may appear when you display the playback screen. You can also set a common login ID by following the on-screen instructions.
• This operation is not available for [Wi-Fi Direct] connection.

When this unit and the smartphone/tablet have acquired different login IDs:

(When you want to use the smartphone's/tablet's login ID for this unit)
Change the login ID and password for this unit to those acquired by the smartphone/tablet.

(When you want to use this unit's login ID for the smartphone/tablet)
Change the login ID and password for the smartphone/tablet to those acquired by this unit.

Check the "LUMIX CLUB" terms of use

Check the details if the terms of use have been updated.

1 **Select [Wi-Fi] in the [Setup] menu.** (P37)
2 **Select [Wi-Fi Setup] in the [Wi-Fi] menu.**
3 **Press ▲/▼ to select [LUMIX CLUB], and press [MENU/SET].**
4 **Press ▲/▼ to select [Terms of use], and press [MENU/SET].**
 • The camera will connect to the network and the terms of use will be displayed. Close the menu after checking the terms of use.

Delete your login ID and account from the “LUMIX CLUB”

Delete the login ID from the camera when transferring it to another party or disposing of it. You can also delete your “LUMIX CLUB” account.

1. **Select [Wi-Fi] in the [Setup] menu.** (P37)
2. **Select [Wi-Fi Setup] in the [Wi-Fi] menu.**
3. **Press ▲/▼ to select [LUMIX CLUB], and press [MENU/SET].**
4. **Press ▲/▼ to select [Delete account], and press [MENU/SET].**
 - The message is displayed. Press [MENU/SET].
5. **Select [Yes] in the login ID delete confirmation screen.**
 - The message is displayed. Press [MENU/SET].
6. **Select [Yes] on the confirmation screen for deleting the “LUMIX CLUB” account.**
 - If you want to continue using the service, selecting [No] will only delete the login ID. Exit the menu after it is executed.
7. **Press [MENU/SET].**
 - The login ID is deleted, and then the message notifying the deletion of your account is displayed. Press [MENU/SET].
 - Exit the menu after it is executed.

- Changes and other actions to login IDs can only be made to the login ID acquired with the camera.

Using WEB services

When sending images to WEB services, such as Facebook or YouTube, the WEB service being used must be registered with the “LUMIX CLUB”. Registering multiple WEB services will send images to all services simultaneously.

- Check the “FAQ/Contact us” on the following site for compatible WEB services.
 http://lumixclub.panasonic.net/eng/c/lumix_faqs/

Preparation:
Make sure that you have created an account on the WEB service you want to use, and have the login information available.

1. **Connect to the “LUMIX CLUB” site using a smartphone/tablet or computer.**
 http://lumixclub.panasonic.net/eng/c/
2. **Enter your “LUMIX CLUB” login ID and password and log in to the service.** (P239)
3. **Save your email address.**
4. **Select the WEB service to be used and save it.**
 - Follow the instructions on the screen to save the service.

Configuring the external AV device settings

Images can be sent to the AV device of relatives and acquaintances via “LUMIX CLUB”.
• See the following site for AV device that is compatible with “LUMIX CLUB”.
http://panasonic.jp/support/global/cs/dsc/ (This Site is English only.)

Preparation:
Check the address number (16-digit number) and access number (4-digit number) of the destination AV device issued by “LUMIX CLUB”.
(Refer to the AV device instruction manual for details)

1 **Select [Wi-Fi] in the [Setup] menu.** (P37)
2 **Select [Wi-Fi Setup] in the [Wi-Fi] menu.**
3 **Press ▲/▼ to select [External AV device], and press [MENU/SET].**
4 **Press ▲/▼ to select [Add new device], and press [MENU/SET].**
5 **Enter the address number and select [Set].**
 • Refer to “Entering Text” (P64) for information on how to enter text.
6 **Enter the access number and select [Set].**
7 **Enter any name and select [Set].**
 • A maximum of 28 characters can be entered.
 • Up to 14 characters can be entered for [＼], [「], [」], [•] and [—].
 • Close the menu after changing settings.

Change or delete information on registered AV device

Information on AV device that has already been saved can be changed or deleted.

1 **Select [Wi-Fi] in the [Setup] menu.** (P37)
2 **Select [Wi-Fi Setup] in the [Wi-Fi] menu.**
3 **Press ▲/▼ to select [External AV device], and press [MENU/SET].**
4 **Press ▲/▼ to select the AV device you want to change or delete, and press [MENU/SET].**
5 **Select [Edit] or [Delete], and press [MENU/SET].**

Item	Description of settings
[Edit]	Change information on AV device that has already been registered. **Perform steps *5* through *7* of “Configuring the external AV device settings”.**
[Delete]	Delete information on AV device that has already been registered. • Confirmation screen is displayed. It is executed when [Yes] is selected.

• Exit the menu after it is executed.

How to Use the [Wi-Fi Setup] Menu

For details on how to select the [Setup] menu settings, refer to P37.

Configure the settings required for the Wi-Fi function.
[Wi-Fi Setup] cannot be changed when connected to Wi-Fi. (excluding [Network Address])

1. **Select [Wi-Fi] in the [Setup] menu. (P37)**
2. **Select [Wi-Fi Setup] in the [Wi-Fi] menu.**
3. **Press ▲/▼ to select item, and press [MENU/SET].**

[LUMIX CLUB]	Acquires or changes the “LUMIX CLUB” login ID.

• Refer to P239 for details.

[Device Name]	You can change the name of this unit. 1 **Press [DISP.].** 2 **Enter the desired device name.**

• Refer to “Entering Text” (P64) for information on how to enter text.
• Up to 32 characters can be entered for [A], [a], [1], and [&].

[External AV device]	Images can be sent to the AV device of relatives and acquaintances via “LUMIX CLUB”.

• Refer to P243 for details.

[Wi-Fi Password]	To prevent incorrect operation or use of the Wi-Fi function by a third party and to protect saved personal information, it is recommended that you protect the Wi-Fi function with a password. Setting a password will automatically display the password input screen when the Wi-Fi function is used.
	[Setup]: Enter any 4-digit numbers as the password. Close the menu after changing settings. **[Delete]:** Confirmation screen is displayed. It is executed when [Yes] is selected. Exit the menu after it is executed.

- For details on how to enter characters, refer to “Entering Text” section on P64.
- Make a copy of password. If you forget the password, you can reset it with [Reset Wi-Fi Settings] in the [Setup] menu, however other settings will also be reset. (excluding [LUMIX CLUB])

[Network Address]	Displays the MAC address and IP address of this unit.

- A “MAC Address” is a unique address that is used to identify network equipment.
- “IP address” refers to a number that identifies a PC connected to a network such as the Internet. Usually, the addresses for homes are automatically assigned by the DHCP function such as a wireless access point. (Example: 192.168.0.87)

[Approved Regulations]＊	The technical compliance standard authentication number is displayed.

＊ [Approved Regulations] is only available on the version (**DMC-GH3P**).

Enjoying 3D pictures

Taking 3D pictures

Attaching the 3D interchangeable lens (H-FT012: optional) to the camera allows you to take 3D pictures for extra impact.
To view 3D pictures, a television that supports 3D is required.

1 Attach the 3D interchangeable lens to the camera.

2 Bring the subject into the frame and record by pressing the shutter button fully.

- Focusing is not required when recording 3D pictures.
- Still pictures recorded with the 3D interchangeable lens attached are saved in MPO format (3D).

To ensure that the 3D pictures can be safely viewed, pay attention to the following points when recording.
- Where possible, record with the unit in a horizontal state.
- The suggested minimum subject distance is 0.6 m (2.0 feet).
- Be careful not to shake the camera while in a vehicle or walking.

- **You cannot record 3D pictures in vertical orientation.**
- It is recommended to use a tripod or a flash to record steady pictures.
- When a distance to the subject is 0.6 m (2.0 feet) to approximately 1 m (3.3 feet), horizontal disparity becomes too great, and you may not see the 3D effect at the edges of the image.
- Up to approx. 500 3D pictures can be recorded on a 2 GB card. (When the aspect ratio is set to [4:3], and the quality is set to [3D].)
- Read the operating instructions of the 3D interchangeable lens for details.

■ Functions that cannot be used during 3D recording

When recording with the 3D interchangeable lens (H-FT012: optional), the following feature will be disabled:

(Recording functions)

- Auto Focus/Manual Focus operation
- Aperture setting
- Zoom operation
- Recording motion pictures*1
- [Glistening Water]/[Glittering Illuminations] (Scene Guide Mode)
- [Impressive Art]/[High Dynamic]/[Toy Effect]/[Star Filter]/[One Point Color] (Creative Control Mode)
- Defocus control function

*1 The motion picture button, Creative Video Mode and the [Motion Picture] menu will be unavailable or unusable.

([Rec] menu)

- [Picture Size]*2/[Quality]*3/[HDR]/[i.Dynamic]/[Red-Eye Removal]/[i.Resolution]/[Shading Comp.]/[Ex. Tele Conv.]/[Digital Zoom]/[SH] of [Burst Rate]/[Stabilizer]

*2 The setting is fixed as shown below.

Aspect ratio	Picture size
4:3	1824×1368 pixels
3:2	1824×1216 pixels
16:9	1824×1024 pixels
1:1	1712×1712 pixels

*3 When attaching 3D interchangeable lens, the following icons are displayed.

[3D ▲▲▲]: [3D+Fine] (Both MPO images and fine JPEG images are recorded simultaneously.)

[3D ▲▲]: [3D+Standard] (Both MPO images and standard JPEG images are recorded simultaneously.)

([Custom] menu)

- [AF/AE Lock]/[Quick AF]/[Eye Sensor AF]/[Direct Focus Area]/[Focus/Release Priority]/[Shutter AF]/[Pinpoint AF Time]/[AF Assist Lamp]/[AF+MF]/[MF Assist]/[MF Guide]/[Power Zoom Lens]/[Video Button]/[Rec Area]/[Remaining Disp.]/[Touch AF], [Touch Pad AF] in [Touch Settings]

Playing back 3D pictures

Connecting the camera to a 3D compatible television and playing back pictures taken in 3D allows you to enjoy 3D pictures for extra impact.
It is also possible to play back the recorded 3D pictures by inserting an SD card into the 3D compatible television with an SD card slot.

For current information regarding devices that can play back 3D pictures recorded with this unit, please refer to the below support site.
http://panasonic.jp/support/global/cs/dsc/ (This Site is English only.)

Preparations: Set the [HDMI Mode] to [AUTO], [1080p] or [1080i]. (P49)
Set the [3D Playback] to [3D]. (P50)

Connect the unit to a 3D compatible television using the HDMI mini cable and display the playback screen. (P250)

- When [VIERA Link] (P50) is set to [ON] and the camera is connected to a TV supporting VIERA Link, input of the TV will be switched automatically and playback screen will be displayed. Refer to P252 for details.
- For the pictures recorded in 3D, [3D] will appear on the thumbnail display at playback.

■ Playback in 3D by selecting only the still pictures recorded in 3D

Select [3D Play] in [Playback Mode] in the [Playback] menu. (P194)

■ Playback as a 3D slide show by selecting only the still pictures recorded in 3D

Select [3D] in [Slide Show] in the [Playback] menu. (P192)

■ Switch the playback method for the still pictures recorded in 3D

1 **Select the picture recorded in 3D.**
2 **Select [2D/3D Settings] on the [Playback] menu. (P37)**
- Playback method will switch to 3D if it is playing back in 2D (conventional image), or it will switch to 2D if it is playing back in 3D.
- If you feel tired, uncomfortable or otherwise strange when playing back pictures recorded in 3D, set to 2D.

■ Functions that cannot be set/do not work with 3D pictures

- [Highlight] ([Custom] menu)*
- Playback Zoom*
- Deleting pictures*
- Editing functions of [Playback] menu ([Title Edit]/[Text Stamp]/[Video Divide]/[Resize]/[Cropping]/[Rotate]/[Favorite]*/[Print Set]*/[Protect]*/[Face Rec Edit]*)

* Can be used when displayed in 2D.

- When a picture recorded in 3D is displayed on this unit, it is played back in 2D (conventional image).
- A black screen is displayed for a few seconds when switching playback back and forth from 3D to 2D pictures.
- When you select a 3D picture thumbnail, it may take a few seconds for playback to start. After playback, the thumbnail display may take a few seconds to reappear.
- When viewing 3D pictures, your eyes may become tired if you are too close to the television screen.
- If your television does not switch to a 3D picture, make the necessary settings on the TV. (For details, refer to the operating instructions of the TV.)
- 3D pictures can be saved to your computer or Panasonic devices. (P254, 259)

Playing Back Pictures on a TV Screen

Pictures recorded with this unit can be played back on a TV screen.

Preparations: Turn this unit and the TV off.

- Confirm the terminals on your TV and use a cable compatible with the terminals. Image quality may vary with the connected terminals.

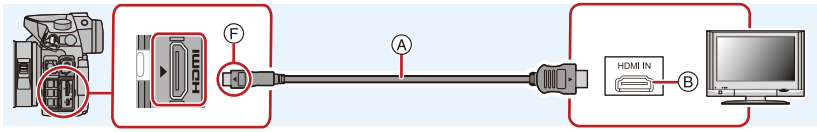
❶ High quality
❷ HDMI socket
❸ Video socket



1 Connect the camera and a TV.

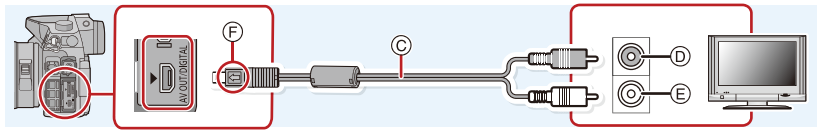
- Check the direction of the terminals and plug in/out straight holding onto the plug. (It may result in malfunction by the deforming of the terminal if it is plugged in obliquely or in wrong direction.)

To connect with an HDMI mini cable (optional)



- Always use a genuine Panasonic HDMI mini cable (RP-CDHM15, RP-CDHM30: optional). Part numbers: RP-CDHM15 (1.5 m) (5 feet), RP-CDHM30 (3.0 m) (10 feet)
- Check the [HDMI Mode]. (P49)
- During 24P motion picture playback, please set [HDMI Mode] to [AUTO]. For settings other than [AUTO], it cannot output at 24 frames/second.
- Audio will be played back as stereo (2ch).
- No picture is displayed on the screen of this unit.

To connect with an AV cable (optional)



- Always use a genuine Panasonic AV cable (DMW-AVC1: optional).
- Check the [TV Aspect]. (P49)
- Audio will be played back in monaural.
- The viewfinder cannot be displayed when connected with a AV cable.

Ⓐ HDMI mini cable (optional)
Ⓑ HDMI socket
Ⓒ AV cable (optional)
Ⓓ Yellow: to the video input socket
Ⓔ White: to the audio input socket
Ⓕ Align the marks, and insert.

2 Turn on the TV and select the input to match the connector in use.

3 Turn the camera on and then press [▶].

- Input of the TV will switch automatically and playback screen is displayed when connected to a VIERA Link compatible TV using an HDMI mini cable with the [VIERA Link] (P50) set to [ON]. (P252)

- Depending on the [Aspect Ratio], black bands may be displayed on the top and bottom or the left and right of the pictures.
- Change the screen mode on your TV if the picture is displayed with the top or bottom cut off.
- Output from the HDMI mini cable (optional) has priority when both AV cable (optional) and HDMI mini cable (optional) are connected.
- The connection with the USB connection cable (supplied) will take priority when you connect the USB connection cable (supplied) simultaneously with the HDMI mini cable (optional).
- When you play back a picture vertically, it may be blurry.
- Proper playback will be dependent on the TV used for viewing.
- No sound is output from the camera speakers.
- Read the operating instructions for the TV.

The recorded pictures can be played back on a TV with an SD Memory Card slot.
- Proper playback (aspect ratio) will be dependent on the TV used for viewing.
- The file format of the motion pictures that can be played back differs depending on the TV model.
- For cards compatible with playback, refer to the operating instructions of the TV.

Using VIERA Link (HDMI)

What is the VIERA Link (HDMI) (HDAVI Control™)?

- VIERA Link™ is a new name for EZ Sync™.
- This function allows you to use your remote control for the Panasonic TV for easy operations when this unit has been connected to a VIERA Link compatible device using a HDMI mini cable (optional) for automatic linked operations. (Not all operations are possible.)
- VIERA Link is a unique Panasonic function built on a HDMI control function using the standard HDMI CEC (Consumer Electronics Control) specification. Linked operations with HDMI CEC compatible devices made by other companies are not guaranteed. When using devices made by other companies that are compatible with VIERA Link, refer to the operating instructions for the respective devices.
- This unit is compatible with VIERA Link Ver.5. VIERA Link Ver.5 is the newest Panasonic version and is also compatible with existing Panasonic VIERA Link devices. (As of November 2011)

Preparations: Set the [VIERA Link] to [ON]. (P50)

1 Connect this unit to a Panasonic TV compatible with VIERA Link with a HDMI mini cable (optional) (P250).

2 Turn the camera on and then press [▶].

3 Operate with the remote control for the TV.

- Operate with reference to the operation icons displayed on the screen.

- To play back the audio of the motion pictures, set the [Sound] in the Slide Show setting screen to [AUTO] or [Audio].
- It is recommended to connect this unit to an HDMI terminal other than the HDMI1 if there are 2 or more HDMI input terminals on the TV.
- Operation using the buttons on this unit will be limited.

Other linked operations

Turning this unit off:

If you use the remote control for the TV to turn the TV off, this unit is also turned off.

Automatic input switching:

- If you connect with a HDMI mini cable and then turn this unit on, and then press [▶], the input channel on the TV automatically switches to this unit's screen. If the TV's power is in standby status, it will turn on automatically (if [Set] has been selected for the TV's [Power on link] setting).
- Depending on your TV's HDMI connection, on some TV's it may be necessary to manually select the HDMI connection you are using. In this case, use the remote control for the TV to switch the input channel. (For details on how to switch input, please read the operating instructions for the TV.)
- If VIERA Link does not work properly, refer to page 298.

- If you are unsure whether or not the TV you are using is compatible with VIERA Link, read the operating instructions for the TV.
- Available linked operations between this unit and a Panasonic TV are different depending on the types of Panasonic TVs even if they are compatible with VIERA Link. Refer to the operating instructions of the TV for the operations are supported on the TV.
- Be sure to use a cable that is HDMI certified.
 Always use a genuine Panasonic HDMI mini cable (RP-CDHM15, RP-CDHM30: optional).
 Part numbers: RP-CDHM15 (1.5 m) (5 feet), RP-CDHM30 (3.0 m) (10 feet)
- [HDMI Mode] for this unit is determined automatically when the VIERA Link is operating.

Saving still pictures and motion pictures on your PC

You can acquire recorded pictures to a PC by connecting the camera and the PC.

- Some PCs can read directly from the card removed from the camera. For details, refer to the operating instructions of your PC.
- **If the computer being used does not support SDXC Memory Cards, a message prompting you to format may appear. (Doing so will cause recorded images to be erased so do not choose to format.)**
 If the card is not recognized, please refer to the below support site.
 http://panasonic.net/avc/sdcard/information/SDXC.html

PC that can be used

The unit can be connected to any PC capable of recognising a mass storage device.

- Windows support: Windows 7/Windows Vista/Windows XP
- Mac support: OS X v10.1 ~ v10.8

AVCHD motion pictures may not be imported correctly when copied as files or folder.

- With Windows, always import AVCHD motion pictures using “PHOTOfunSTUDIO”, one of the programs on the CD-ROM (supplied).
- With a Mac, AVCHD motion pictures can be imported using “iMovie’11”.
 Note that motion pictures (AVCHD Progressive) recorded in [FHD/60p] of [AVCHD] cannot be imported.
 (For details about iMovie’11, please contact Apple Inc.)

About the supplied software

The supplied CD-ROM includes the following software.
Install the software on to your computer before use.

- **PHOTOfunSTUDIO 8.5 PE (Windows XP/Vista/7)**

 This software allows you to acquire pictures to the PC, and also categorize these acquired pictures by their recording date or the model name of the camera used. You can resize pictures and add effects to the pictures. Various printing functions, such as layout printing, and writing function to CD-R* are supported too. If you forgot to set the date on the digital camera, you can add the date of recording to pictures with this software.
 Also, [AVCHD] motion pictures can be loaded and written to DVD.
 * This can be used only if the [Recording] tab is displayed on the [Properties] of the CD/DVD drive on the PC.

- **SILKYPIX Developer Studio**
 (Windows XP/Vista/7, Mac OS X v10.4/v10.5/v10.6/v10.7/v10.8)

 This is software to edit RAW format images.
 Using RAW files recorded on this camera allows images to be edited with a higher quality.
 Edited images can be saved in a format (JPEG, TIFF, etc.) that can be displayed on a personal computer.

For details on how to use the SILKYPIX Developer Studio, refer to the "Help" or the Ichikawa Soft Laboratory's support website:
http://www.isl.co.jp/SILKYPIX/english/p/support/

- **LoiLoScope 30 day full trial version (Windows XP/Vista/7)**

 LoiLoScope is a video editing software where that draws out the full power of your PC. Creating videos is as easy as organizing cards on top of a desk. Use your music, picture and video files to create videos to share with your friends and family by burning it to a DVD, uploading it to websites, or simply share your videos with your friends via e-mail.
 – This will only install a shortcut to the trial version download site.

For more information on how to use LoiLoScope, read the LoiLoScope manual available for download at the link below.
Manual URL: http://loilo.tv/product/20

Installing supplied software

• Before inserting the CD-ROM, close all running applications.

1 Check the environment of your PC.

• **Operating environment of "PHOTOfunSTUDIO 8.5 PE"**
– OS:
Windows® XP (32bit) SP3,
Windows Vista® (32bit) SP2,
Windows® 7 (32bit/64bit) or SP1
– CPU:
Pentium® III 500 MHz or higher (Windows® XP),
Pentium® III 800 MHz or higher (Windows Vista®),
Pentium® III 1 GHz or higher (Windows® 7)
– Display:
1024×768 pixels or more (1920×1080 pixels or more recommended)
– RAM:
512 MB or more (Windows® XP/Windows Vista®),
1 GB or more (Windows® 7 32bit),
2 GB or more (Windows® 7 64bit)
– Free hard disk space:
450 MB or more for installing software
• Refer to the operating instructions of "PHOTOfunSTUDIO" (PDF) for further operating environment.
• For details on SILKYPIX Developer Studio 3.1 SE, please read the support site given on P255.

2 Insert the CD-ROM with the supplied software.

• When you insert the supplied CD-ROM, the install menu will start.

3 Click on the [Recommended Installation].

• Proceed with installation according to messages appearing on the screen.

• The software compatible with your PC will be installed.
• "PHOTOfunSTUDIO" is not compatible with Mac.
• On the Mac, SILKYPIX can be installed manually.

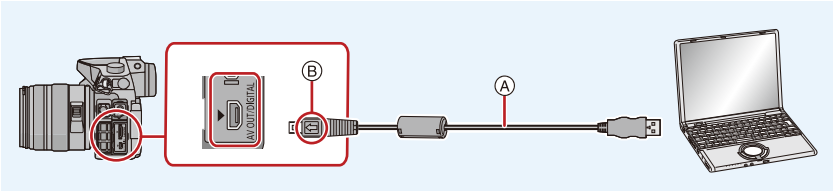
❶ Insert the CD-ROM with the supplied software.
❷ Double-click on the automatically displayed folder.
❸ Double-click the icon in the application folder.

■ Transferring pictures to a PC

Preparations: Install “PHOTOfunSTUDIO” to the PC.

1 Connect the computer and camera with the USB connection cable (supplied).

- Please turn this unit on and your PC before connecting.
- Turn the monitor toward you.
- Check the directions of the connectors, and plug them straight in or unplug them straight out. (Otherwise, the connectors may bend out of shape, which will cause a malfunction.)
- Do not use any other USB connection cables except the supplied one or a genuine Panasonic USB connection cable (DMW-USBC1: optional).



Ⓐ USB connection cable (supplied)
Ⓑ Align the marks, and insert.

2 Press ▲/▼ to select [PC], and then press [MENU/SET].

- If [USB Mode] (P48) is set to [PC] in the [Setup] menu in advance, the camera will be automatically connected to the PC without displaying the [USB Mode] selection screen.
- When the camera is connected to a PC while [USB Mode] is set to [PictBridge(PTP)], a message may appear on the PC screen. In that case, close the message, and remove the USB connection cable safely (P258), and then set the [USB Mode] to [PC].

3 Copy the images to a PC using “PHOTOfunSTUDIO”.

- Do not delete or move copied files or folders in Windows Explorer. When viewing in “PHOTOfunSTUDIO”, you will not be able to play back or edit.

- Use a battery with sufficient battery power or the AC adaptor (optional). If the remaining battery power becomes low while the camera and the PC are communicating, the alarm beeps. Refer to “Disconnecting the USB connection cable safely” (P258) before disconnecting the USB connection cable. Otherwise, data may be destroyed.
- Before connecting or disconnecting the AC adaptor (optional), turn the camera off.
- Before inserting or removing a card, turn the camera off and disconnect the USB connection cable. Otherwise, data may be destroyed.

Copying to a PC without using "PHOTOfunSTUDIO"

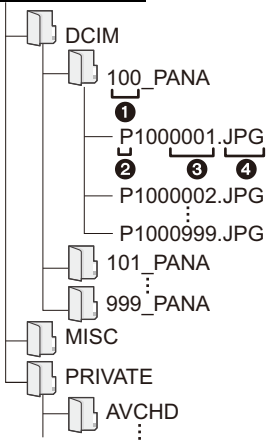
If you are not able to install "PHOTOfunSTUDIO", you can copy files and folders to your PC by dragging and dropping files from this unit.

• The content (folder structure) on the card of this unit is as follows.

For Windows: **A drive ([Removable Disk]) is displayed in [Computer]**

For Mac: **A drive ([NO_NAME]) is displayed on the desktop**

• Card



DCIM:	Images
❶ Folder number	
❷ Color space	P: sRGB _: AdobeRGB
❸ File number	
❹ JPG:	Still pictures
MP4:	[MP4] Motion pictures
MOV:	[MOV] Motion pictures
RW2:	Pictures in RAW files
MPO:	3D pictures
MISC:	DPOF print
	Favorite
AVCHD:	[AVCHD] Motion pictures

• AVCHD motion pictures may not be imported correctly when copied as files or folder. We recommend using "PHOTOfunSTUDIO" on the CD-ROM (supplied) for importing files. Refer to P254 for details.

• A new folder is created when pictures are taken in the following situations.
 – After [No.Reset] (P51) in the [Setup] menu has been executed
 – When a card containing a folder with the same folder number has been inserted (such as when pictures were taken using another maker of camera)
 – When there is a picture with file number 999 inside the folder

Disconnecting the USB connection cable safely

Select the [] icon in the task tray displayed on the PC, and then click [Eject DMC-XXX] (XXX varies by model).

• Depending on your PC's settings, this icon may not be displayed.

• If the icon is not displayed, check that [Access] is not displayed on the monitor of the digital camera before removing the hardware.

Connection in the PTP Mode

Set [USB Mode] to [PictBridge(PTP)].

• Data can now be read only from the card in the PC.

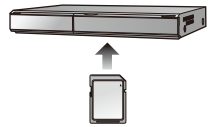
• When there are 1000 or more pictures on a card, the pictures may not be imported in the PTP mode.

• Motion picture cannot be played back in PTP Mode.

Saving still pictures and motion pictures on a Recorder

If you insert card holding content recorded with this unit into a Panasonic recorder, you can dub the content to a Blu-ray Disc or DVD etc.
Methods to export still pictures and motion pictures to other devices will vary depending on the file format. (JPEG, RAW, MPO, AVCHD, MP4 or MOV).

For details on Panasonic devices compatible with the respective file format (such as a Blu-ray Disc recorder), refer to the support sites below.
http://panasonic.jp/support/global/cs/dsc/
(This Site is English only.)
∗ Some compatible devices may not be sold in certain countries and regions.

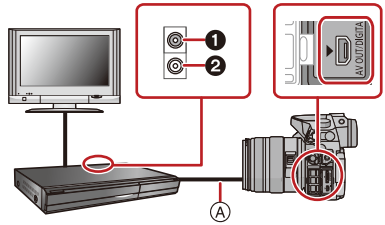


• See the operating instructions for the recorder about the details about copying and playing back.

■ Dubbing with non-compatible equipment

You can dub the content played back using this unit to non-compatible equipment such as recorders and video players by connecting this unit to the non-compatible equipment using an AV cable (optional). Non-compatible equipment will be able to play back the content. This is convenient if you wish to pass around dubbed content. In this case, the content will be played back in standard rather than high-definition picture quality.

1. **Connect this unit with the recording equipment with an AV cable (optional).**
2. **Start the playback of this unit.**
3. **Start the recording on the recording equipment.**
 • When ending the recording (copying), stop the playback on this unit after stopping the recording on recording equipment.



❶ Yellow: to the video input socket
❷ White: to the audio input socket
Ⓐ AV cable (optional)

• When you play back motion pictures on 4:3 aspect ratio TV, you must set [TV Aspect] (P49) on this unit to [4:3] before starting a copy. The image will be vertically long if you play back motion pictures copied with [16:9] setting on a [4:3] aspect TV.
• Always use a genuine Panasonic AV cable (DMW-AVC1: optional).
• See the operating instructions for the recording equipment for details about copying and playing back.

Printing the Pictures

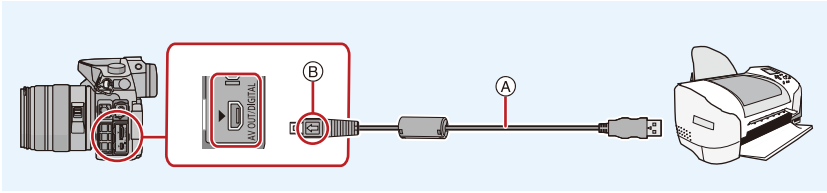
If you connect the camera to a printer supporting PictBridge, you can select the pictures to be printed out and instruct that printing be started on the camera's monitor.

- Grouped pictures are displayed individually.
- Some printers can print directly from the card removed from the camera. For details, refer to the operating instructions of your printer.

Preparations: Turn on the camera and the printer.
Perform the print quality and other settings at the printer before printing the pictures.

1 Connect the printer and camera with the USB connection cable (supplied).

- Turn the monitor toward you.
- Check the directions of the connectors, and plug them straight in or unplug them straight out. (Otherwise, the connectors may bend out of shape, which will cause a malfunction.)
- Do not use any other USB connection cables except the supplied one or a genuine Panasonic USB connection cable (DMW-USBC1: optional).



Ⓐ USB connection cable (supplied)
Ⓑ Align the marks, and insert.

2 Press ▲/▼ to select [PictBridge(PTP)], and then press [MENU/SET].

- Use a battery with sufficient battery power or the AC adaptor (optional). If the remaining battery power becomes low while the camera and the printer are connected, the status indicator blinks and the alarm beeps. If this happens during printing, stop printing at once. If not printing, disconnect the USB connection cable.
- Do not disconnect the USB connection cable while [⛒] (Cable disconnect prohibit icon) is displayed. (May not be displayed depending on the type of printer used)
- Before connecting or disconnecting the AC adaptor (optional), turn the camera off.
- Before inserting or removing a card, turn the camera off, and disconnect the USB connection cable.
- Motion pictures recorded cannot be printed out.

Selecting a single picture and printing it

1 **Press ◄/► to select the picture and then press [MENU/SET].**



2 **Press ▲ to select [Print start] and then press [MENU/SET].**

- Refer to P262 for the items that can be set before starting to print the pictures.
- Disconnect the USB connection cable after printing.

Selecting multiple pictures and printing them

1 **Press ▲.**

2 **Press ▲/▼ to select an item and then press [MENU/SET].**

Item	Description of settings
[Multi Select]	Multiple pictures are printed at one time. • Press ▲/▼/◄/► to select the pictures and then press [MENU/SET]. (When [MENU/SET] is pressed again, the setting is canceled.) • After the pictures have been selected, press ◄ to select [OK], and then press [MENU/SET].
[Select All]	Prints all the stored pictures.
[Print Set (DPOF)]	Prints the pictures set in [Print Set] only. (P204)
[Favorite]	Prints the pictures set as favorites only. (P203)

3 **Press ▲ to select [Print start] and then press [MENU/SET].**

- If the print check screen has appeared, select [Yes], and print the pictures.
- Refer to P262 for the items which can be set before starting to print the pictures.
- Disconnect the USB connection cable after printing.

Print Settings

Select and set the items both on the screen in step *2* of the "Selecting a single picture and printing it" and in step *3* of the "Selecting multiple pictures and printing them" procedures.

- When you want to print pictures on a paper size or a layout which is not supported by the camera, set [Paper Size] or [Page Layout] to [🖨] and then set the paper size or the layout on the printer. (For details, refer to the operating instructions of the printer.)
- When [Print Set (DPOF)] has been selected, the [Print with Date] and [Num.of prints] items are not displayed.

■ [Print with Date]

Item	Description of settings
[ON]	Date is printed.
[OFF]	Date is not printed.

- If the printer does not support date printing, the date cannot be printed on the picture.
- Depending on the printer, the date print settings of the printer may take precedence so check if this is the case.
- When printing images with a text stamp, please remember to set print with date to [OFF] or the date will print on top.
- In some printers, the picture date for pictures taken with the aspect ratio set to [1:1] will be printed vertically.

When asking the photo shop to print the pictures

- By stamping the date using [Text Stamp] (P197) or setting date printing at the time of the [Print Set] (P204) setting before going to a photo shop, the dates can be printed on the pictures at the photo shop.

■ [Num.of prints]

You can set the number of prints up to 999.

[Paper Size]

Item	Description of settings
	Settings on the printer are prioritized.
[L/3.5″×5″]	89 mm×127 mm
[2L/5″×7″]	127 mm×178 mm
[POSTCARD]	100 mm×148 mm
[16:9]	101.6 mm×180.6 mm
[A4]	210 mm×297 mm
[A3]	297 mm×420 mm
[10×15cm]	100 mm×150 mm
[4″×6″]	101.6 mm×152.4 mm
[8″×10″]	203.2 mm×254 mm
[LETTER]	216 mm×279.4 mm
[CARD SIZE]	54 mm×85.6 mm

• Paper sizes not supported by the printer will not be displayed.

[Page Layout] (Layouts for printing that can be set with this unit)

Item	Description of settings
	Settings on the printer are prioritized.
	1 picture with no frame on 1 page
	1 picture with a frame on 1 page
	2 pictures on 1 page
	4 pictures on 1 page

• An item cannot be selected if the printer does not support the page layout.

Layout printing

When printing a picture several times on 1 sheet of paper.

For example, if you want to print the same picture 4 times on 1 sheet of paper, set [Page Layout] to [] and then set [Num.of prints] to 4 for the picture that you want to print.

When printing different pictures on 1 sheet of paper.

For example, if you want to print 4 different pictures on 1 sheet of paper, set [Page Layout] to [] and then set [Num.of prints] to 1 for each of the 4 pictures.

- The camera is receiving an error message from the printer when the [●] indication lights orange during printing. After finishing printing, make sure there are no problems with the printer.
- If the number of prints is high, the pictures may be printed several times. In this case, the remaining number of prints indicated may differ from the number set.
- Only pictures taken in JPEG format can be printed. Those taken in RAW will use the JPEG pictures that were simultaneously created. If an equivalent JPEG picture is not available, no print will take place.

Optional accessories

External Flash (optional)

After attaching the external flash (DMW-FL360L, DMW-FL220, DMW-FL360, DMW-FL500: optional), the effective range will be increased when compared to the camera's built in flash.

■ Using the dedicated flash (DMW-FL360L: optional)

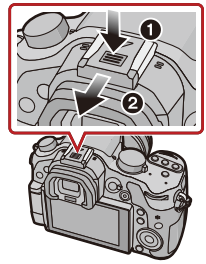
Preparations:

- Close the built-in flash, and then turn this unit off.
- Remove the hot shoe cover that is attached to the camera.

Removing the Hot Shoe Cover

The camera comes with a hot shoe cover attached to the hot shoe.

Remove the hot shoe cover by pulling it in the direction indicated by arrow ❷ while pressing it in the direction indicated by arrow ❶.



- When the hot shoe is not in use, make sure to attach the hot shoe cover.
- Please be careful not to lose the hot shoe cover.
- Keep the Hot Shoe Cover out of reach of children to prevent swallowing.

1. **Attach the dedicated flash to the hot shoe and then turn on the camera and the dedicated flash.**
2. **Select [Flash] on the [Rec] menu.** (P37)
3. **Press ▲/▼ to select [Flash Mode] and then press [MENU/SET].**
4. **Press ▲/▼ to select an item and then press [MENU/SET].**
 - While the external flash is connected, the following icons are displayed.

 : External flash Forced ON

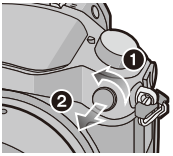
 S: External flash Slow Sync.

 : External flash Forced OFF

When using other commercially available external flashes without communication functions with the camera (DMC-GH3)

- It is necessary to set the exposure on the external flash. If you want to use the external flash in Auto Mode, use an external flash that allows you to set the aperture value and the ISO sensitivity to match the settings on the camera.
- Set to Aperture-Priority AE Mode or Manual Exposure Mode on the camera and then set the same aperture value and ISO sensitivity on the external flash. (The exposure cannot be compensated adequately due to the change on the aperture value in Shutter-Priority AE Mode and the external flash cannot control the light adequately in Program AE Mode because the aperture value cannot be fixed.)

Using a external flash by connecting with a flash synchro socket



- You can use an external flash by connecting a synchro cable with a flash synchro socket. The socket has a lock screw to prevent the cable falling off.
- Remove the flash synchro socket cap by turning in the direction of the arrow.
- Be careful not to lose the flash synchro socket cap.
- The flash synchro socket has no polarity. You can use a synchro cable regardless of its polarity.
- Use the flash with a synchronisation voltage of 400 V or less.
- Do not use the synchro cables with the length of 3 m (9.8 feet) or more.

- You can set the aperture value, the shutter speed and the ISO sensitivity on the camera even when attaching the external flash.
- Some commercial external flashes have synchro terminals with high-voltage or reversed polarity. Using such extra flashes may cause a malfunction or the camera may not operate normally.
- If you use commercially available external flashes with communication functions other than the dedicated one, they may not operate normally or they may be damaged. Do not use them.
- Even if the external flash is turned off, the camera may enter the external flash mode when the external flash is attached. When you are not using the external flash, detach it.
- Do not open the built-in flash when an external flash is attached.
- The camera will become unstable when attaching the external flash, it is recommended to use a tripod when taking picture.
- Detach the external flash when carrying the camera.
- When attaching the external flash, do not hold only the external flash because it may detach from the camera.
- If you use the external flash when the White Balance is set to [WB] finely adjust the White Balance depending on the picture quality. (P138)
- If you record at close range with a wide angle, light from the flash may be blocked by the lens, darkening the lower part of the screen.
- Refer to P129 about the settings for the wireless flash.
- Read the operating instructions of the external flash for details.

External Microphone (optional)

Using the stereo shotgun microphone (DMW-MS2:optional), you can switch between the gun (ultra-directional) recording and the wide range stereo recording.

Preparations:
- Close the built-in flash, and then turn this unit off.
- Remove the hot shoe cover that is attached to the camera. (P265)

1 Attach the dedicated stereo shotgun microphone to this unit, and then turn this unit on.

2 Select [Special Mic.] on the [Motion Picture] menu. **(P37)**
- The menu items are displayed only when the stereo shotgun microphone is connected.

3 Press ▲/▼ to select the Item and then press [MENU/SET].

[STEREO]: Allows stereo recording of sound over a wide area.

[SHOTGUN]: Allows recording from one direction by shutting out background and surrounding noise.

- While the external microphone is connected, [🎤] is displayed on the screen.
- When the external microphone is connected, [Mic Level Disp.] (P190) is automatically set to [ON], and the mic level is displayed on the screen.
- When attaching the stereo shotgun microphone, do not hold only the stereo shotgun microphone because it may detach from the camera.
- [Wind Cut] in the [Motion Picture] can reduce the wind noise effectively.
- Do not open the built-in flash when the stereo shotgun microphone is attached.
- If the noises are recorded when you use an AC adaptor (optional), use a battery.
- Read the operating instructions of the stereo shotgun microphone for details.

Battery Grip (optional)

Using a battery grip (DMW-BGGH3: optional) improves ease of operation and grip when held vertically. Installing a spare battery will allow you to record for a longer time.

■ Setting a priority for the use of spare batteries

You can set which battery should be used when the battery is inserted to both this unit and the battery grip.

Preparations:
• Turn this unit off, and then remove the terminal cover.

1 **Attach the battery grip to this unit, and then turn this unit on.**
2 **Select [Battery Use Priority] in the [Setup] menu.** **(P37)**
3 **Press ▲/▼ to select the item, and then press [MENU/SET].**

[BODY]: The battery in this unit is used first.
[BG]: The battery in the battery grip is used first.

• When the battery in the battery grip is used, [BG] is displayed on the screen.
• You can assign a function of your choice to the [Fn] button of the battery grip. (P42)
• If the terminal cover is hard to remove, flip the cover's corner by the camera's recess toward the center.
• Read the operating instructions of the battery grip for details.

Remote Shutter (optional)

If you use the remote shutter (DMW-RSL1: optional), you can avoid jitter (camera shake) when using a tripod and you can keep the shutter pressed fully when taking pictures with [B] (Bulb) or Burst Mode. The remote shutter works similar to the shutter button on the camera.

• Always use a genuine Panasonic remote shutter (DMW-RSL1: optional).
• You cannot operate the camera with the remote shutter in the following cases.
– When the Sleep Mode is canceled
• Record with Creative Video Mode (P184) when using for motion picture recording.
Motion picture recording can be started/stopped with the remote shutter.
• Read the operating instructions of the remote shutter for details.

AC adaptor (optional)/DC coupler (optional)

By connecting the AC adaptor (optional), and then plugging them into an electrical socket, you can connect this unit to a PC or printer and use without worrying about the capacity of the battery. To use the AC adaptor, a DC coupler (optional) is required.

- Always use a genuine Panasonic AC adaptor (optional).
- When using an AC adaptor, use the AC cable supplied with the AC adaptor.
- When the DC coupler is being mounted, the DC coupler cover opens, so the structure ceases to be dust-proof and splash-proof. Be careful not to allow sand, dust and water etc. to adhere to or enter the structure. After use, check that there is no foreign matter attached to the coupler cover, and close it firmly.
- Also read the operating instructions for the AC adaptor and DC coupler.

Filters (optional)

The MC protector is a transparent filter which affects neither the colors nor the amount of light, so it can always be used to protect the camera's lens.
The ND filter reduces the amount of light to approximately 1/8th (equal to adjusting the aperture value 3 increments) without affecting the color balance.
PL filter will suppress the reflected light from a metal or non spherical surfaces (flat non-metallic surfaces, water vapour or invisible particles in the air), making it possible to take a picture with enhanced contrast.

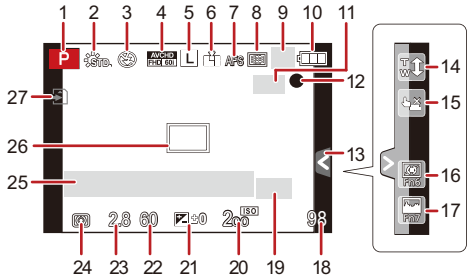
- Do not attach multiple filters at the same time.
- You can attach the lens cap or the lens hood when the filter is attached.
- Refer to the instructions for each filter for details.

Monitor Display/Viewfinder Display

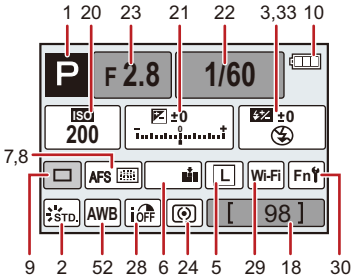
• **The following images are examples of when the display screen is set to [] (monitor style) in the monitor.**

In recording

Recording in Program AE Mode [P]

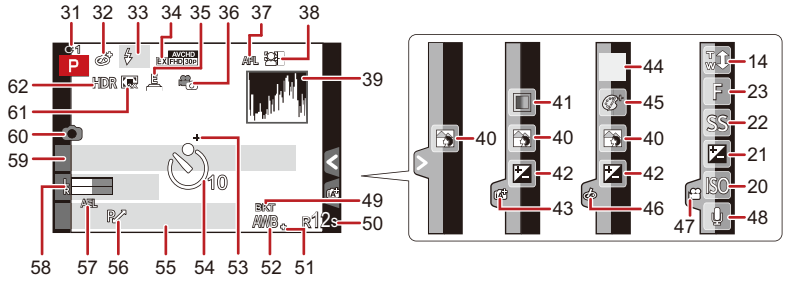


On-monitor recording information



1 Recording Mode (P84)
2 Photo Style (P158)
3 Flash Mode (P125)
4 REC MODE (when recording motion pictures)/Recording quality (P177)
5 Picture size (P160)
6 Quality (P161)
7 Focus Mode (P142)
8 AF Mode (P141)
9 : Single*1 (P68)
: Burst (P153)
: Auto Bracket (P155)
: Self-timer (P157)
10 Battery indication (P25)
11 : Optical Image Stabilizer*2 (P117)/
: Jitter alert (P117)
12 Recording state (Flashes red.)/
Focus (Lights green.) (P68)
13 Touch tab*3 (P62)
14 Touch zoom*3 (P122)
15 Touch Shutter*3 (P70)
16 Fn6 (Function button)*3 (P44)
17 Fn7 (Function button)*3 (P44)
18 Number of recordable pictures*4 (P33)
19 Extended Tele Conversion (when taking still pictures) (P120)
20 ISO sensitivity (P134)
21 Exposure compensation value (P133)/ Brightness (P113)/Manual Exposure Assistance (P89)
22 Shutter speed (P68)
23 Aperture value (P68)
24 Metering Mode (P162)
25 Exposure meter (P58)
Focal distance display (P61)
Step zoom (P61)
26 AF area (P68, 146)
27 Card (P31) (displayed only during recording)/Elapsed recording time (P180): 8m30s*5
28 Intelligent Dynamic Range Control (P163)
29 Wi-Fi (P211)
30 Function button setting (P42)

In recording (after settings)

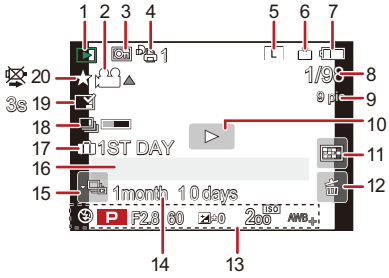


31 Custom settings (P115)
32 Creative control adjustment display (P101)
33 Flash (P127, 128, 129)
34 Extended Tele Conversion (when recording motion pictures) (P119)
35 Electronic shutter (P167)
160%: Frame Rate (P185)
36 Picture Mode (P183)
37 AF Lock (P151)
38 Face Recognition (P172)
39 Histogram (P57)
40 Defocus control function*3 (P112)
41 Color*3 (P114)
42 Brightness*3 (P113)
43 Touch tab ()*3 (P62, 113)
44 : Type of defocus ([Miniature Effect])*3 (P106)/
: [One Point Color]*3 (P108)
45 Creative control adjustment*3 (P101)
46 Touch tab ()*3 (P62, 101)
47 Touch tab ()*3 (P62, 186)
48 Microphone level adjustment (P190)
49 White Balance Bracket (P139)
50 Available recording time*4 (P34): R8m30s*5
51 White Balance Fine Adjustment (P138)
52 White Balance (P136)/ : Color (P114)
53 Spot metering target (P162)
54 Self-timer*6 (P157)
: Time Lapse Shot (P166)
55 Current date and time/ : Travel destination setting*7 (P45)
56 Program Shift (P86)
57 AE Lock (P151)

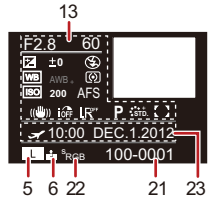
58 Mic level display (P190)
Age[*8] (P176)
Location[*7] (P46)
59 Name[*8] (P176)
Number of days that have passed since the departure date[*7] (P46)
60 Simultaneous recording indicator (P183)
61 Digital Zoom (P119)
62 HDR (P164)
: Multi exposure (P165)

*1 Displayed only on the on-monitor recording information screen.
*2 Only available when a lens that supports the Stabilizer function is attached.
*3 Only displayed in the monitor.
*4 It is possible to switch the display between the number of recordable pictures and available recording time with the [Remaining Disp.] setting in the [Custom] menu.
*5 “h” is an abbreviation for hour, “m” for minute and “s” for second.
*6 This is displayed during countdown.
*7 This is displayed for about 5 seconds when the camera is turned on, after setting the clock and after switching from Playback Mode to Recording Mode.
*8 This is displayed for about 5 seconds when the camera is turned on if the [Profile Setup] setting is set.

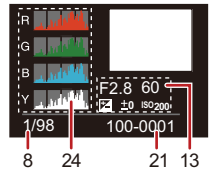
In playback



Detailed information display



Histogram display



1 Playback Mode (P194)
2 ▲: Motion picture playback (P78)/ ▲: Continuously Burst Picture Group Playback (P80) ▲: Continuously [Time Lapse Shot] Picture Group Playback (P80)
3 Protected picture (P205)
4 Number of prints (P204)
5 Picture size (P160) Recording mode (when recording motion pictures)/ AVCHD FHD 60i: Recording quality (P177)
6 Quality (P161)
7 Battery indication (P25)
8 Picture number/Total pictures
9 Number of pictures in burst/ Motion picture recording time (P78): 8m30s*1
10 Playback (Motion Picture, Group pictures) (P78, 79)
11 Multi Playback (P76)
12 Delete (P82)
13 Recording information*2
i.DR OFF: Intelligent Dynamic Range Control (P163)
HDR ON: HDR (P164)
i.R OFF: Intelligent Resolution (P163)
[]: [Shading Comp.] (P170)
14 Age (P176)
15 Burst Picture Group Display (P80) : [Time Lapse Shot] Picture Group Display (P79)
16 Name*3 (P174, 176)/Location*3 (P46)/ Title*3 (P196)
17 Number of days that have passed since the departure date (P46)
18 Currently retrieving information icon (P276)
19 Stamped with text indication (P197) Elapsed playback time (P78): 8m30s*1
20 Favorites (P203) Cable disconnection prohibit icon (P260)
21 Folder/File number*2 (P258)
22 Color space*4 (P171)
23 Recorded date and time/World Time (P45)
24 Histogram (P81)

*1 "h" is an abbreviation for hour, "m" for minute and "s" for second.
*2 This is not displayed for motion pictures recorded in [AVCHD].
*3 It is displayed in order of [Title], [Location], [Name] ([Baby1]/[Baby2], [Pet]), [Name] ([Face Recog.]).
*4 This is not displayed for motion pictures recorded in [AVCHD]/[MP4]/[MOV].

Message Display

Confirmation messages or error messages will be displayed on the screen in some cases. The major messages are described below as examples.

[This picture is protected]

→ Delete the picture after canceling the protect setting. (P205)

[This picture cannot be deleted]/[Some pictures cannot be deleted]

- This feature can only be used with pictures that comply with the DCF standard.
 → If you want to delete some pictures, format the card after saving necessary data on a PC etc. (P52)

[Cannot be set on this picture]

- [Title Edit], [Text Stamp] or [Print Set] cannot be set for pictures not based on the DCF standard.

**[Memory Card Error
Format this card?]**

- It is a format that cannot be used with this unit.
 → Insert a different card.
 → Format the card again with the camera after saving necessary data on a PC etc. (P52)
 Data will be deleted.

[Lens not found, or shoot w/o lens in Custom menu is set to off.]

- When using a Leica lens mount adaptor (DMW-MA2M, DMW-MA3R: optional), set [Shoot w/o Lens] (P63) to [ON] in the custom menu.

[The lens is not attached properly. Do not push lens release button while lens is attached.]

- Detach the lens once, and then attach it again without pressing the lens release button. (P20)
 Turn this unit on again, and if it is still displaying, contact the dealer.

[Lens attachment failed. Please make sure the lens is attached correctly.]

- Detach the lens from the camera body and gently wipe the contacts on the lens and the camera body using a dry cotton swab. Attach the lens, turn this unit on again, and if it is still displaying, contact the dealer.

[Lens not detected. Please turn camera on again.]

- This is displayed when the lens has stopped operating normally due to being pressed on by a hand etc.
 → Turn the camera off and on. If the message persists, contact the dealer or Panasonic.

[Memory Card Error]/[Memory card parameter error]/[This memory card cannot be used]

→ Use a card compatible with this unit. (P31)

- SD Memory Card (8 MB to 2 GB)
- SDHC Memory Card (4 GB to 32 GB)
- SDXC Memory Card (48 GB, 64 GB)

[Insert SD card again]/[Try another card]

- An error has occurred accessing the card.
 → Insert the card again.
 → Insert a different card.

**[Read Error/Write Error
Please check the card]**

- It has failed to read or write data.
 → Remove the card after turning this unit off. Insert the card again, turn this unit on, and try to read or write the data again.
- The card may be broken.
 → Insert a different card.

[Cannot record due to incompatible format(NTSC/PAL) data on this card.]

→ If you want to delete some pictures, format the card after saving necessary data on a PC etc. (P52)
→ Insert a different card.

[Motion recording was cancelled due to the limitation of the writing speed of the card]

- Use a card with SD Speed Class with “Class 4” or more for [AVCHD]/[MP4] motion picture recording, and use “Class 10” for [MOV].
- If recording stops even by using a card of the above specified SD Speed Class, the data writing speed is decreasing. We recommend you make a backup, and then format (P52).
- Depending on the type of the card, motion picture recording may stop in the middle.

[A folder cannot be created]

- A folder cannot be created because there are no remaining folder numbers that can be used.
 → Format the card after saving necessary data on a PC etc. (P52) If you execute [No.Reset] in the [Setup] menu after formatting, the folder number is reset to 100. (P51)

[Picture is displayed for 16:9 TV]/[Picture is displayed for 4:3 TV]

- Select [TV Aspect] in the [Setup] menu if you want to change the TV aspect. (P49)
- This message also appears when the USB connection cable is connected to the camera only. In this case, connect the other end of the USB connection cable to a PC or a printer. (P257, 260)

[Editing operation cannot proceed as information processing is ongoing.]

When a card with pictures deleted or file names changed using a PC or other device is inserted into this unit, it will automatically retrieve new information and reconstruct the group pictures. The currently retrieving information icon [] may be displayed in the playback screen for long period of time when there are many image files, and deletion or [Playback] menu cannot be used during this time.

- If this unit is turned off while acquiring information, only the pictures that have already acquired the information are saved as a group. When you switch on again, the information retrieval will restart from the same point.

[This battery cannot be used]

- Use a genuine Panasonic battery. If this message is displayed even when a genuine Panasonic battery is used, contact the dealer or Panasonic.
- If the battery terminal is dirty, clean it and remove any objects.

[Failed to connect wireless access point]/[Connection failed]/[No destination found]

- Check following regarding the wireless access point.
 → The wireless access point information set on this unit is wrong. Check the authentication type, encryption type, and encryption key. (P218)
 → Power of the wireless access point is not turned on.
 → Setting of the wireless access point is not supported by this unit.
- Check the network setting of the destination.
- Radio waves from other devices may block the connection to a wireless access point. Check other devices that are connected to the wireless access point and devices that use the 2.4 GHz band.

[No picture to send]

- This is displayed when there is no image to transmit due to the restriction of the destination. Check the file type of the image to transmit. (P208)

[Connection failed. Please retry in a few minutes.]/[Network disconnected. Transfer stopped.]

- Radio waves from the wireless access point are getting weak. Perform the connection closer to the wireless access point.
- There is no reply from the server or it has exceeded the communication processing time. Try again after a while.
- Depending on the wireless access point, connection may be automatically disconnected after specific time has passed. Reconnect the connection again.

[Upload to the Cloud Folder is available after Cloud Sync settings have been set up on downloadable devices such as PCs or smartphones.]

- Devices that download images from a cloud folder are not registered.
- Perform Cloud Sync setting. Configure the settings on a PC with "PHOTOfunSTUDIO" or on a smartphone/tablet with "LUMIX LINK". Refer to P227 for details on [Cloud Sync. Service].

[Connection failed]

- Check following regarding the smartphones/tablet you intend to connect.
 → The smartphone/tablet does not operate.
 → Change the access point to connect to in the smartphone/tablet Wi-Fi settings to this camera.
 → There is no free storage space on the smartphone/tablet.

[Login failed. Please check Login ID and Password.]

- Login ID or password for the "LUMIX CLUB" is not correct. Please enter it again. If you have forgotten the login ID or the password, there is information in the login screen of the "LUMIX CLUB" website.

[Some files cannot be sent because of destination limit]/[Transfer completed. Some files are left because of destination limit.]

- Check the file format of the image to send. (P208)
- Sending motion pictures may fail if the file size is too large. Split the motion picture using [Video Divide]. (P199)

[Unavailable. Please set Login settings on LUMIX CLUB web site.]

- Login to the "LUMIX CLUB" from your smartphone/tablet or PC, and set the login details of the destination WEB service.

[Both picture and video sharing service cannot be selected together]

- WEB services designed only for pictures, and WEB services designed only for motion pictures cannot be selected at the same time. Deselect one of the services.

[Cannot get IP address. Please set wireless AP's IP address setting to DHCP.]

- Turn on DHCP settings of the IP address of the connected wireless access points.

[Cannot connect to server]

- If a message is displaying asking to update the root certificate, agree to update the root certificate.

Menu list

Click the followings to jump to the beginning of each menu.

[Rec] P278
[Motion Picture] P280
[Custom] P281
[Setup] P283
[Playback] P285

[Rec]

This menu lets you set the aspect ratio, number of pixels and other aspects of the pictures you are recording.

• [Photo Style], [Metering Mode], [i.Dynamic], [i.Resolution] and [Digital Zoom] are common to both the [Rec] menu and [Motion Picture] menu. Changing these settings in one of these menus is reflected in other menu.

[Photo Style]	You can select effects to match the type of image you wish to record. You can adjust the color and image quality of the effects.	P158
[Aspect Ratio]	Sets the aspect ratio of the image.	P160
[Picture Size]	Set the number of pixels.	P160
[Quality]	Set the compression rate at which the pictures are to be stored.	P161
[Metering Mode]	Sets the light metering method for measuring brightness.	P162
[Burst Rate]	Sets the burst speed for burst recording.	P153
[Auto Bracket]	Sets single/burst recording, compensation range and recording sequence for Auto Bracket recording.	P156
[Self Timer]	Set the time delay for the self-timer recording.	P157
[i.Dynamic] (Intelligent dynamic range control)	Automatically corrects contrast and exposure.	P163
[i.Resolution]	Records pictures with more defined outlines and sense of clarity.	P163
[HDR]	You can combine 3 pictures with different levels of exposure into a single picture with rich gradation.	P164
[Multi Exp.]	Gives an effect like multi exposure. (up to 4 times equivalent per a single image)	P165

[Time Lapse Shot]	You can set the recording start time, the recording interval and the number of pictures, and automatically record subjects such as animals and plants as time elapses.	P166
[Electronic Shutter]	The electronic shutter can reduce the picture blur.	P167
[Shutter Delay]	To reduce the influence of hand shake, shutter is released after the specified time has passed.	P168
[Flash]	Sets the manner in which the flash works.	P168
[Red-Eye Removal]	Automatically detects red-eye caused by the flash and corrects the image data accordingly.	P168
[ISO Increments]	The ISO sensitivity settings values changes in steps of 1/3 EV or 1 EV.	P169
[Extended ISO]	Allows you to adjust the ISO from the minimum [ISO125] to the maximum [ISO25600].	P169
[Long Shtr NR]	You can eliminate the noise caused by recording with a slower shutter speed.	P169
[Shading Comp.]	If the screen periphery darkens as a result of lens characteristics, the brightness in this region will be corrected.	P170
[Ex. Tele Conv.]	When the number of pixels is set to anything other than [L], the Tele effect is increased without degradation in image quality.	P120
[Digital Zoom]	Increases the Tele effect. The higher the level of magnification, the greater the degradation in image quality.	P119
[Color Space]	Set this when you want to correct the color reproduction of the recorded pictures on a PC, printer etc.	P171
[Stabilizer]	When camera shake is sensed during recording, the camera corrects it automatically.	P117
[Face Recog.]	Sets the focus and exposure automatically prioritising registered faces.	P172
[Profile Setup]	If you set the name and birthday of your baby or pet in advance, you can record their name and age in months and years in the images.	P176

[Motion Picture]

This menu lets you set the [Rec Mode], [Rec Quality], and other aspects for motion picture recording.

- [Photo Style], [Metering Mode], [i.Dynamic], [i.Resolution] and [Digital Zoom] are common to both the [Rec] menu and [Motion Picture] menu. Changing these settings in one of these menus is reflected in other menu.
 – For details, refer to the explanation for the corresponding setting in the [Rec] menu.

[Rec Mode]	Sets the file format for the motion pictures you record.	P177
[Rec Quality]	This sets up the picture quality of motion pictures.	P177
[Exposure Mode]	Select the method for setting the aperture value and shutter speed in Creative Video Mode.	P184
[Frame Rate]	Adds the slow/quick effect to motion pictures in Creative Video Mode.	P185
[Picture Mode]	Sets the recording method for still pictures during motion picture recording.	P183
[Continuous AF]	Continues to focus on the subject for which focus has been achieved.	P180
[Time Code]	Sets the time code.	P187
[Rec Highlight]	White saturated areas appear blinking in black and white.	P189
[Ex. Tele Conv.]	Increases the Tele effect.	P119
[Flkr Decrease]	The shutter speed can be fixed to reduce the flicker or striping in the motion picture.	P189
[Silent Operation]	Enables touch operations to allow silent use while recording motion pictures.	P186
[Mic Level Disp.]	Set whether or not the mic levels are displayed on the screen.	P190
[Mic Level Adj.]	Adjust the sound input level to 19 different levels.	P190
[Special Mic.]	Sets the sound recording method when a stereo shotgun microphone (optional) is connected.	P267
[Headphone Sound]	Sets the sound output method when headphones (optional) are connected.	P182
[Wind Cut]	Reduces the wind noise effectively if there is wind noise when recording sound.	P191

[Custom]

Operation of the unit, such as displaying of the screen and button operations, can be set up according to your preferences. Also, it is possible to register the modified settings.

[Cust.Set Mem.]	Registers the current camera settings as custom set.	P115
[AF/AE Lock]	Sets the fixed content for focusing and exposure when the AF/AE lock is on.	P151
[AF/AE Lock Hold]	This will set the operation of [AF/AE LOCK] button when taking a picture with fixed focus or exposure.	P53
[Shutter AF]	Set whether or not the focus is adjusted automatically when the shutter button is pressed halfway.	P53
[Half Press Release]	The shutter will immediately fire when the shutter button is pressed halfway.	P53
[AFS/AFF]	Assigns [AFS] or [AFF] to [AFS/AFF] of the focus mode lever.	P54
[Quick AF]	Speeds up the focusing that takes place when you press the shutter button.	P54
[Eye Sensor AF]	The camera automatically adjusts the focus when the eye sensor is active.	P67
[Pinpoint AF Time]	Sets the time for which the screen is enlarged when the shutter button is pressed halfway with Auto Focus Mode set to [⊞].	P54
[AF Assist Lamp]	AF assist lamp will illuminate the subject when the shutter button is pressed half-way making it easier for the camera to focus when recording in low light conditions.	P55
[Direct Focus Area]	Moves the AF area or MF assist using the cursor button when recording.	P147, P149
[Focus/Release Priority]	It will set so no picture can be taken when it is out of focus.	P55
[AF+MF]	You can set the focus manually after the automatic focus has finished.	P56
[MF Assist]	Sets the display method of MF Assist (enlarged screen).	P56

[MF Guide]	When you set the focus manually, an MF guide that allows you to check the direction to achieve focus is displayed.	P148
[Histogram]	This allows you to set either to display or not display the histogram.	P57
[Guide Line]	This will set the pattern of guide lines displayed when taking a picture.	P57
[Highlight]	When the Auto Review function is activated or when playing back, white saturated areas appear blinking in black and white.	P58
[Constant Preview]	You can check the effects of the chosen aperture and shutter speed on the recording screen in Manual Exposure Mode.	P90
[Expo.Meter]	Set whether or not to display the exposure meter.	P58
[LVF Disp.Style]	This will set the display style of the Live Viewfinder.	P73
[Monitor Disp. Style]	This will set the display style of the monitor.	P72
[Monitor Info. Disp.]	Display the recording information screen. (P72)	P59
[Rec Area]	This changes the angle of view during motion picture recording and still picture recording.	P59
[Remaining Disp.]	This will switch display between the number of recordable pictures and available recording time.	P59
[Auto Review]	Set the length of time that the picture is displayed after taking the still picture.	P59
[Fn Button Set]	You can assign various recording and other functions to the function button.	P42
[Q.MENU]	Switch the setting method of Quick Menu.	P59
[Dial Set.]	Changes the operation methods of the front dial and rear dial.	P60
[Video Button]	Enables/disables the motion picture button.	P60
[Power Zoom Lens]	Sets the screen display and lens operations when using an interchangeable lens that is compatible with power zoom (electrically operated zoom).	P61

[Eye Sensor]	Enable or disable the eye sensor. You can also set the sensitivity of the eye sensor.	P62
[Touch Settings]	Enables/disables the Touch operation.	P62
[Touch Scroll]	This allows you to set the speed of continuously forwarding or rewinding pictures using touch operation.	P62
[Menu Guide]	Set the screen that is displayed when the mode dial is set to SCN and .	P63
[Shoot w/o Lens]	Sets whether or not the shutter can be released when no lens is attached to the main body.	P63

[Setup]

This menu lets you perform the clock settings, select the operating beep tone settings and set other settings which make it easier for you to operate the camera.
You can also configure the settings of Wi-Fi related functions.

[Clock Set]	Setting Date/Time.	P35
[World Time]	Sets the times for the region where you live and your holiday destination.	P45
[Travel Date]	Departure date and return date of the trip as well as the name of the travel destination can be set.	P46
[Wi-Fi]	Configure the each setting for Wi-Fi functions.	P244
[Beep]	Set the volume for electronic noises and the electronic shutter noise.	P46
[Speaker Volume]	Adjust the volume of the speaker to any of 7 levels.	P47
[Headphone Volume]	Adjust the volume of when connected headphone (optional) from 16 levels.	P47
[Monitor Display]/ [Viewfinder]	Brightness, color, or red or blue tint of the Monitor/Live Viewfinder is adjusted.	P47
[Monitor Luminance]	Set the monitor brightness to suit the amount of surrounding light.	P47

[Economy]	Suppresses the unit's power consumption to prevent the battery from being run down.	P48
[Battery Use Priority]	When batteries are inserted to both this unit and the battery grip, you can set that which battery should be used first.	P268
[USB Mode]	Sets the communication method when connecting using the USB connection cable (supplied).	P48
[Output]	This sets how the unit connects to a television etc.	P49
[VIERA Link]	Equipment that supports the VIERA Link will connect automatically.	P50
[3D Playback]	Set the output method for 3D pictures.	P50
[Menu Resume]	Stores the location of the last-used menu item for each menu.	P51
[Menu Background]	Set the background color for the menu screen.	P51
[Menu Information]	Descriptions of menu items or their settings are displayed on the menu screen.	P51
[Language]	Set the language displayed on the screen.	P51
[Version Disp.]	This enables the firmware versions of the camera and lens to be checked.	P51
[No.Reset]	Returns the image file number to 0001.	P51
[Reset]	The [Rec] or [Setup]/[Custom] menu settings are reset to the initial settings.	P51
[Reset Wi-Fi Settings]	Reset all settings in the [Wi-Fi] menu to factory default settings. (excluding [LUMIX CLUB])	P52
[Pixel Refresh]	It will perform optimisation of imaging device and image processing.	P52
[Sensor Cleaning]	Dust reduction to blow off the debris and dust that have affixed to the front of the imaging device is performed.	P52
[Format]	The card is formatted.	P52

[Playback]

This menu lets you set the Protection, Cropping or Print Settings, etc. of recorded pictures.

[2D/3D Settings]	Switches the playback method for 3D images.	P192
[Slide Show]	Selects the type etc. of the images and plays back in order.	P192
[Playback Mode]	Selects the type etc. of the images and plays back only particular images.	P194
[Location Logging]	The location information (longitude/latitude) acquired by the smartphone/tablet can be sent to the camera and written in images.	P195
[Title Edit]	Input texts (comments) on the recorded pictures.	P196
[Text Stamp]	Stamps the recorded pictures with recording date and time, names, travel destination, travel date, etc.	P197
[Video Divide]	Splits the recorded motion picture in two.	P199
[Resize]	Reduces the image size (number of pixels).	P200
[Cropping]	Crops the recorded image.	P201
[Rotate]	Rotate pictures manually in 90° steps.	P202
[Rotate Disp.]	This mode allows you to display pictures vertically if they were recorded holding the camera vertically.	P202
[Favorite]	Marks can be added to images, and images can be set as favorites.	P203
[Print Set]	Sets the images for printing and the number of prints.	P204
[Protect]	Protects images to prevent deletion by mistake.	P205
[Face Rec Edit]	Removes or changes information relating to personal identity.	P206

Troubleshooting

First, try out the following procedures (P286–300).

If the problem is not resolved, **it may be improved by selecting [Reset] (P51) on the [Setup] menu**.

Battery and power source

The camera cannot be operated even when it is turned on. The camera turns off immediately after it is turned on.

- The battery is exhausted.
- Charge the battery.
- If you leave the camera on, the battery will be exhausted.
 → Turn the camera off frequently by using the [Economy] etc. (P48)

This unit is turned off automatically.

- If you connect to a TV compatible with VIERA Link with a HDMI mini cable (optional) and turn the TV off with the remote control for the TV, this unit is also turned off.
 → If you are not using VIERA Link, set [VIERA Link] to [OFF]. (P50)

The battery door does not close.

- Insert the battery securely all the way in. (P29)

The battery becomes flat too quickly.

- Is a Wi-Fi connection being used for a long period of time? The battery can become flat quickly when connected to Wi-Fi.
 → Turn the camera off frequently by using the [Economy] etc. (P48)

Recording

Taking pictures is not possible. The shutter will not operate immediately when the shutter button is pressed.

- Is the subject focused?
 → [Focus/Release Priority] is set to [FOCUS] at the time of purchase, and so you cannot take pictures until the subject is in focus. If you want to be able to take a picture when you press the shutter button fully even if the subject is not focused, set [Focus/Release Priority] in the [Custom] menu to [RELEASE]. (P55)

The recorded picture is whitish.

- Picture might look whitish when lens or image sensor gets dirty with fingerprints or similar.
 → If the lens is dirty turn the camera off and then gently wipe the lens surface with a soft, dry cloth.
 → Refer to P302 when the image sensor gets dirty.

The recorded picture is too bright or dark.

→ Check that the exposure is correctly compensated. (P133)
- Is the AE Lock (P151) applied incorrectly?

Multiple pictures are taken at one time.

→ Cancel the settings of White Balance Bracket (P139).
- Is the self-timer (P157) set to [10]?

The subject is not focused properly.

- The subject is beyond the focus range of the camera. (P69)
- There is camera shake (jitter) or the subject is moving slightly. (P117)
- Is [Focus/Release Priority] in the [Custom] menu set to [RELEASE]? (P55)
 In this case, the picture may not be properly focused even if [AFS], [AFF] or [AFC] in Focus Mode is set.
- Is [Shutter AF] in the [Custom] menu set to [OFF]? (P53)
- Is the AF Lock (P151) applied incorrectly?

The recorded picture is blurred. The Optical Image Stabilizer is not effective.

- The shutter speed will become slower and the Optical Image Stabilizer function may not work properly when taking pictures especially in dark places.
 → We recommend holding the camera firmly with both hands when taking pictures. (P65)
 → We recommend using a tripod and the self-timer (P157) when taking pictures with a slow shutter speed.
- Are you using a lens which supports the Stabilizer function? (P19)

Taking pictures using White Balance Bracket is not possible.

- Is there any memory remaining on the card?

The recorded picture looks rough.
Noise appears on the picture.

- Is the ISO sensitivity high or the shutter speed slow?
 ([Sensitivity] is set to [AUTO] when the camera is shipped. Therefore, when taking pictures indoors etc. noise will appear.)
 → Decrease the ISO sensitivity. (P134)
 → Increase the setting for [Noise Reduction] in [Photo Style] or lower the setting for each of the items other than [Noise Reduction]. (P159)
 → Take pictures in bright places.
 → Set the [Long Shtr NR] to [ON]. (P169)
- Is the [Picture Size] (P160) or the [Quality] (P161) set low?
- Is the [Digital Zoom] set? (P119)

Striping or flicker may appear under lighting such as fluorescent lighting and LED lighting fixture.



- This is characteristic of MOS sensors which serve as the camera's pickup sensors.
 This is not a malfunction.
- When you see noticeable flicker or striping while recording a motion picture, you can reduce the flicker or striping by setting up [Flkr Decrease] (P189) and fixing the shutter speed. It is possible to select a shutter speed from [1/50], [1/60], [1/100], or [1/120].
 You can set the shutter speed manually in the Creative Video Mode. (P184)

Stripes appear in high ISO sensitivity.
[When the interchangeable lens (H-H020) is used]

- Stripes may appear in high ISO sensitivity or depending on the lens you use.
 → Decrease the ISO sensitivity. (P134)

The brightness or the hue of the recorded picture is different from the actual scene.

- When recording under fluorescent or LED lighting fixture, etc., increasing the shutter speed may introduce slight changes to brightness and color. These are a result of the characteristics of the light source and do not indicate a malfunction.
- When recording subjects in extremely bright locations or recording under fluorescent lighting, LED lighting fixture, mercury lamp, sodium lighting, etc., the colors and screen brightness may change or horizontal striping may appear on the screen.

Bright spot not in subject is recorded.

• There may be defective pixels in the image sensor. Perform [Pixel Refresh] (P52).

Subject cannot be locked. (AF tracking not possible)

• Set the AF area to the distinctive color of the subject if there is a part that is different from the surrounding color. (P144)

Operation sound is small.

• Is your finger covering up the speaker? (P11)

Motion pictures

Recording motion pictures is not possible.

• You may not be able to record for a short while after turning this unit on when using a large capacity card.

Motion picture recording stops in the middle.

• Use a card with SD Speed Class with “Class 4” or more for [AVCHD]/[MP4] motion picture recording, and use “Class 10” for [MOV].
• Depending on the type of the card, recording may stop in the middle.
→ If recording stops even by using a card of the above specified SD Speed Class, or if you are using a card on which recording and deletion were repeated many times or a card formatted on a PC or another device, the data writing speed is decreasing. We recommend you make a backup, and then format (P52).

When recording a motion picture, the screen may go dark.

• When recording a motion picture, the screen may go dark after a certain period to reduce battery consumption, but this will not affect the recorded motion picture.

The screen may be blacked out momentarily, or the unit may record noise.

• The screen may be blacked out momentarily, or the unit may record noise due to static electricity or electromagnetic waves etc. depending on the environment of the motion picture recording.

Object seems to be warped.

- Object seems to be warped slightly when the object moves across the image very fast, but this is because the unit is using MOS for the image sensor. This is not a malfunction.

In motion pictures, abnormal clicking and buzzing sounds are recorded. The recorded sound is very quiet.

- With recording in a quiet environment, depending on the lenses used, the sound of aperture and focus actions may be recorded in motion pictures. This is not a malfunction. Focus operation while recording motion pictures can be set to [OFF] with [Continuous AF] (P180).
- If you use the zoom function, buttons or dials during motion picture recording, operational sounds may be recorded. Use of [Silent Operation] is recommended if you are concerned about operational sounds. (P186)
- While recording motion pictures, plugging the aperture of the microphone with a finger may reduce the level of audio recording or audio may not record at all. Also be careful because the operation sound of lenses can easily be recorded at this time.

Lens

Recorded image may be warped, or nonexistent color is surrounding the subject.

- Depending on the lens used, picture may be warped slightly or you may see colors along the edge depending on the zoom factor, due to the characteristics of the lens. Also, the peripherals of the image might look warped because the perspective is enhanced when the wide angle is used. This is not a malfunction.

Flash

The flash is not activated.

- Is the flash closed?
 → Press the flash open button to open the flash. (P123)

The flash is activated 2 times.

- The flash is activated 2 times. The interval between the first and second flash is longer when Red-Eye Reduction (P125) is set so the subject should not move until the second flash is activated.

Monitor/Viewfinder

The Monitor/Viewfinder turns off although the camera is turned on.

- If no operations are performed during the set time period, [Auto LVF/Monitor Off] (P48) is activated, and the Monitor/Viewfinder turns off.
- When an object or your hand is positioned near the eye sensor, the Monitor display may switch to the Viewfinder display. (P66)

The Monitor/Viewfinder is too bright or dark.

- Check [Monitor Luminance] setting. (P47)
- Perform [Monitor Display]/[Viewfinder]. (P47)

It may flicker for an instant or the brightness of the screen may change significantly for an instant.

- This occurs due to the aperture of the lens changing when the shutter button is pressed halfway, or when the brightness of the subject changes. This is not a malfunction.

The picture is not displayed on the monitor.

- Does the picture appear on the viewfinder?
 → Press [LVF] to switch to monitor display. (P66)
- Is the monitor switched off?
 → Switch the display by pressing [DISP.]. (P72)

Monitor and viewfinder do not switch when [LVF] is pressed.

- It is only displayed on the monitor when the camera is connected to a PC or printer.

Black, red, blue and green dots appear on the Monitor/Viewfinder.

- This is not a malfunction.
 These pixels do not affect the recorded pictures.

Unevenly bright parts or irregular colors appear on the Monitor/Viewfinder.

- Monitor/viewfinder of this unit adopts OLED. Screen burn-in may occur on the screen/viewfinder when a same image is displayed for a long period of time, but it does not affect the recorded images.
 → Change the on-screen images frequently by using [Economy] (P48), [Eye Sensor] function (P66), or turning off the screen light (P72).

Noise appears on the monitor.

- In dark places, noise may appear to maintain the brightness of the monitor.

Monitor/viewfinder appears to be colored when you see it from an angle.

- This is a characteristic of this unit's monitor, and this is not a malfunction.

The color tone of the viewfinder differs from the actual tone.

- Being a characteristic of the viewfinder of this unit, this phenomenon is not a problem. Recorded images are not affected.

Playback

The picture being played back is not rotated, or is rotated in an unexpected direction, when displayed.

- You can display the pictures without being rotated when [Rotate Disp.] (P202) is set to [OFF].
- You can rotate pictures with the [Rotate] function. (P202)

The picture is not played back. There are no recorded pictures.

- Did you press [▶]?
- Is the card inserted?
- Is there a picture on the card?
- Is this a folder or picture which was processed in the PC? If it is, it cannot be played back by this unit.
 → It is recommended to use the "PHOTOfunSTUDIO" software in the CD-ROM (supplied) to write pictures from PC to card.
- Has [Playback Mode] been set for playback?
 → Change to [Normal Play]. (P194)

The folder number and the file number are displayed as [—] and the screen turns black.

- Is this a non-standard picture, a picture which has been edited using a PC or a picture which was taken by another make of digital camera?
- Did you remove the battery immediately after picture-taking or did you take the picture using a battery with a low remaining charge?
 → Format the data to delete the pictures mentioned above. (P52)
 (Other pictures will be deleted as well and it will not be possible to restore them. Therefore, check well before formatting.)

Playback sound or operation sound is too low.

• Is something covering up the speaker? (P11)

Images with different date as recorded date are played back in the Calendar Playback.

• Is the clock in the camera set properly? (P35)
• Images edited on a PC or images recorded on other cameras might display a different date to the recorded date during the Calendar Playback.

White round spots like soap bubbles appear on the recorded picture.

• If you take a picture with the flash in a dark place or indoors, white round spots may appear on the picture caused by the flash reflecting of particles of dust in the air. This is not a malfunction.
A characteristic of this is that the number of round spots and their position differ in every picture.



[Thumbnail is displayed] appears on the screen.

• Is it a picture that has been recorded with other equipment? In such cases, these pictures may be displayed with a deteriorated picture quality.

Red part of the recorded image has changed color to black.

• When Digital Red-Eye Correction ([ϟ👁], [ϟS👁]) is in operation, if you take a picture of a subject with red color surrounded by a skin tone color, that red part may be corrected to black by the Digital Red-Eye Correction function.
→ It is recommended to take a pictures with the flash closed, Flash Mode set to [ϟ], or [Red-Eye Removal] set to [OFF]. (P168)

Motion pictures recorded with this model cannot be played back on other equipment.

• The picture quality or sound quality of recorded motion pictures may be deteriorated even when these are played back with the compatible devices. Also, recording information may not be displayed correctly.

About the Wi-Fi function

It cannot connect to the wireless LAN. Radio waves get disconnected.

- Use within the communication range of the wireless LAN network.
- Connection types and security setting methods are different depending on the wireless access point.
 → Refer to the operating instructions of the wireless access point.
- When the radio waves are interrupted, the condition may improve by moving the location or changing the angle of the wireless access point.
- It may not automatically connect when the network SSID of the wireless access point is set not to broadcast.
 → Set the network SSID of the wireless access point to broadcast.
- Is any device, such as microwave oven, cordless phone, etc., that uses 2.4 GHz frequency operated nearby?
 → Radio waves may get interrupted when used simultaneously. Use them sufficiently away from the device.
- Is the 5 GHz/2.4 GHz switchable wireless access point connected to other equipment using the 5 GHz band?
 → The use of a wireless access point that can use 5 GHz/2.4 GHz simultaneously is recommended. It cannot be used simultaneously with this camera if it is not compatible.
- When the battery indicator is flashing red, the connection with other equipment may not start or the connection may be disrupted. (A message such as [Communication error] is displayed.)

Wireless access point is not displayed. Or it cannot be connected.

- Check if the wireless access point to connect is in operating state.
- The camera may not display or connect to a wireless access point depending on the radio wave condition.
 → Perform the connection closer to the wireless access point.
- It may not display even if the radio waves exist depending on the setting of the wireless access point.
 → Check the settings of the wireless access point.
- The wireless access point may not be found depending on the radio wave condition.
 → Perform the [Manual Connection]. (P218)
- Is the network SSID of the wireless access point set not to broadcast?
 → It may not be detected when it is set not to broadcast. Enter and set the network SSID. (P218)
- Try the following:
 → Move this unit closer to the wireless access point
 → Remove the obstacles between this unit and the wireless access point
 → Change the direction of this unit

It takes long time every time to connect to a smartphone/tablet.

• It may take longer time to connect depending on the Wi-Fi connection setting of the smartphone/tablet, but it is not a malfunction.

This unit is not displayed in the Wi-Fi setting screen of the smartphone/tablet. It takes time to setup the connection.

→ Try switching the ON/OFF of the Wi-Fi function in the Wi-Fi settings of the smartphone/tablet.

I have forgotten the login ID or password for the "LUMIX CLUB".

• Check the information in the login screen of "LUMIX CLUB".
http://lumixclub.panasonic.net/eng/c/

I do not have a wireless access point at my home, but I would like to perform service user registration of the "LUMIX CLUB".

• Service user registration for the "LUMIX CLUB" is not possible in the environment without a wireless access point.

Images cannot be transmitted to the WEB service.

→ Confirm that the login information (login ID/user name/email address/password) is correct.
• WEB service server or the network may be busy.
→ Try again after a while.
→ Check the site of the WEB service you are sending the image to.

It takes time to transmit an image to the WEB service.

• Is the size of the image too large?
→ Reduce the image size at [Size] (P224), and then send.
→ Transmit after dividing the motion picture with [Video Divide] (P199).
• It may take longer time to transmit when distance to the wireless access point is far.
→ Transmit closer to the wireless access point.

The image that was supposed to have uploaded to the WEB service is not there.

- Upload may not complete when it is disconnected while transmitting the image.
- It may take some time after uploading the image to be reflected in the WEB service depending on the status of the server.
 → Wait for a while and try again.
- You can check the transmission status on the WEB service link settings by logging into “LUMIX CLUB”.

I would like to return the image in the WEB service to the camera.

- The images in the WEB Service cannot be saved (downloaded) to this unit. Do not delete the uploaded images, and make a backup of them.

I cannot display or delete the images uploaded to the WEB service by this unit.

- The images uploaded to the WEB service cannot be displayed or deleted by this unit.
 → Perform the task using a smartphone/tablet or a PC.

Your “LUMIX CLUB” login ID and password were deleted after sending the camera in to be repaired.

- The settings stored in the camera may be deleted depending on the type of repair.
 → Always make a copy of important settings.

There is an image that could not be transmitted.

- Is the size of the image too large?
 → Divide the motion picture using [Video Divide] (P199).
 → Reduce the image size at [Size] (P224), and then send.
- Capacity or number of images in the WEB service is full.
 → Login to “LUMIX CLUB”, and check the status of the destination on the WEB service link settings.

I have forgotten the password for the Wi-Fi.

→ Execute the [Reset Wi-Fi Settings] in the [Setup] menu. (P52)
→ However, all the information you have set on the [Wi-Fi Setup] menu, which includes the “LUMIX CLUB” login settings, will be reset. (excluding [LUMIX CLUB])

Transmission of the image fails midway.

- Is the size of the image too large?
 → Transmit after dividing the motion picture with [Video Divide] (P199).
 → Reduce the image size at [Size] (P224), and then send.
 → Image cannot be transmitted when the battery indicator is flashing red.

Motion picture cannot be transmitted.

- File format of the motion picture that can be sent differs depending on the destination. (P208)
- Is the size of the image too large?
 → Transmit after dividing the motion picture with [Video Divide] (P199).

I cannot send images to an AV device.

- Sending may fail depending on the operational status of the AV device.
 Also, sending may take a while.

TV, PC and printer

The picture does not appear on the television.

- Is the camera connected to the TV correctly?
 → Set the TV input to external input mode.

The display areas on the TV screen and the camera's monitor are different.

- Depending on the TV model, the pictures may be extended horizontally or vertically or they may be displayed with their edges cut off.

The motion pictures cannot be played back on a TV.

- Are you trying to play back the motion pictures by directly inserting the card in the card slot of the TV?
 → Connect the camera to the TV with the AV cable (optional), or with the HDMI mini cable (optional), and then play back the motion pictures on the camera. (P250)

The picture is not displayed fully on the TV.

→ Check [TV Aspect] setting. (P49)

VIERA Link does not work.

• Is it connected properly with the HDMI mini cable (optional)? (P250)
→ Confirm that the HDMI mini cable (optional) is firmly fitted.
→ Press [▶] on this unit.
• Is the [VIERA Link] on this unit set to [ON]? (P50)
→ Depending on HDMI terminal of the TV, the input channel may not switch automatically. In this case, use the remote control for the TV to switch input. (For details on how to switch input, please read the operating instructions for the TV.)
→ Check the VIERA Link setting on the connected device.
→ Turn this unit off and on.
→ Set [HDAVI Control] to [Off] on the TV and then turn it back to [On]. (Refer to the operating instructions of the TV for details.)

Cannot communicate with the PC.

• Is the camera connected to the PC correctly?
• Is the camera recognized by the PC correctly?
→ Set to [PC] in [USB Mode]. (P48, 257)
→ Turn this unit off and on.

The card is not recognized by the PC.

→ Disconnect the USB connection cable. Connect it again while the card is inserted in the camera.
→ If there are two or more USB terminal on a single PC, try connecting the USB connection cable to another USB terminal.

The card is not recognized by the PC. (SDXC memory card is used)

→ Check if your PC is compatible with SDXC memory cards.
http://panasonic.net/avc/sdcard/information/SDXC.html
→ A message prompting to format the card may be displayed when connecting, but do not format.
→ If the [Access] displayed on the monitor does not disappear, disconnect the USB connection cable after turning this unit off.

The picture cannot be printed when the camera is connected to a printer.

• Pictures cannot be printed using a printer that does not support PictBridge.
→ Set to [PictBridge(PTP)] in [USB Mode]. (P48, 260)

The ends of the pictures are cut at printing.

→ When using a printer with a Cropping or borderless printing function, cancel this function before printing. (For details, refer to the operating instructions for the printer.)
→ When you order photo studios to print pictures, ask the photo studio if the 16:9 pictures can be printed.

Others

The camera makes a noise when this unit is turned on.

• This is the noise of the Dust Reduction Function working (P302); it is not a malfunction.

There is a sound from lens unit.

• It is a sound of lens movement or aperture operation when this unit is turned on or off, and it is not a malfunction.
• You may hear a sound from the lens and image in the monitor may suddenly change when the brightness has changed by zoom operation or moving the camera, but there is no effect on recording.
The sound is caused by the automatic adjustment of the aperture. This is not a malfunction.

An unreadable language was selected by mistake.

→ Press [MENU/SET], select the [Setup] menu icon [] and then select the [] icon to set the desired language. (P51)

Part of the picture is flashing in black and white.

• This is a highlight function showing the white saturated area. (P58)

A red lamp sometimes turns on when the shutter button is pressed halfway.

• In dark places, the AF Assist Lamp (P55) lights red to make it easier to focus on a subject.

The AF Assist Lamp does not turn on.

• Is [AF Assist Lamp] set to [ON]? (P55)
• The AF Assist Lamp does not turn on in bright places.

The camera becomes warm.

- The surface of the camera and the reverse side of the monitor may become warm during use. This does not affect the performance or quality of the camera.

The clock is reset.

- If you do not use the camera for a long time, the clock may be reset.
 → [Please set the clock] message will be displayed; please reset the clock. (P35)

The file numbers are not recorded consecutively.

- When you perform an operation after taking a certain action, the pictures may be recorded in folders with different numbers from the ones used prior to the operation.

The file numbers are recorded with previously used numbers.

- If you insert or remove the battery before turning off this unit, the folder and file numbers for the pictures taken will not be stored in the memory. When this unit is turned on again and pictures are taken, they may be stored under file numbers which should have been assigned to previous pictures.

Cautions for Use

Optimal use of the camera

Keep this unit as far away as possible from electromagnetic equipment (such as microwave ovens, TVs, video games etc.).

- If you use this unit on top of or near a TV, the pictures and/or sound on this unit may be disrupted by electromagnetic wave radiation.
- Do not use this unit near cell phones because doing so may result in noise adversely affecting the pictures and/or sound.
- Recorded data may be damaged, or pictures may be distorted, by strong magnetic fields created by speakers or large motors.
- Electromagnetic wave radiation generated by microprocessors may adversely affect this unit, disturbing the pictures and/or sound.
- If this unit is adversely affected by electromagnetic equipment and stops functioning properly, turn this unit off and remove the battery or disconnect AC adaptor (optional). Then reinsert the battery or reconnect AC adaptor and turn this unit on.

Do not use this unit near radio transmitters or high-voltage lines.

- If you record near radio transmitters or high-voltage lines, the recorded pictures and/or sound may be adversely affected.

Always use the supplied cords and cables. If you use optional accessories, use the cords and the cables supplied with them.
Do not extend the cords or the cables.

Do not spray the camera with insecticides or volatile chemicals.

- If the camera is sprayed with such chemicals, the body of the camera may be damaged and the surface finish may peel off.
- Do not keep rubber or plastic products in contact with the camera for a long period of time.

Cleaning

Before cleaning the camera, remove the battery or the DC coupler (optional), or disconnect the power plug from the outlet. Then wipe the camera with a dry, soft cloth.

- When the camera is soiled badly, it can be cleaned by wiping the dirt off with a wrung wet cloth, and then with a dry cloth.
- Wipe off any dirt or dust on the zoom ring and the focus ring with a dry, dustless cloth.
- Do not use solvents such as benzine, thinner, alcohol, kitchen detergents, etc., to clean the camera, since it may deteriorate the external case or the coating may peel off.
- When using a chemical cloth, be sure to follow the accompanying instructions.

■ About dirt on the image sensor

This camera features an interchangeable lens system so dirt may get inside the camera body when changing lenses. Depending on the recording conditions, dirt on the image sensor may appear on the recorded picture.
To prevent debris or dust adhering to internal parts of the body, avoid changing the lens in a dusty environment and always fit the body cap or a lens when storing the camera.
Remove any dirt on the body cap before attaching it.

Dust reduction function
This unit has a dust reduction function that will blow off the debris and dust that have affixed to the front of the imaging device. This function will function automatically when the camera is turned on, but if you see dust, perform the [Sensor Cleaning] (P52) in the [Setup] menu.

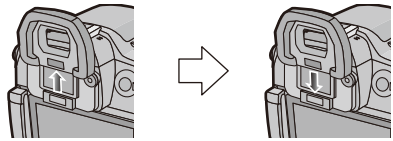
Removing dirt on the image sensor

The image sensor is very precise and delicate, so be sure to observe the following when you do have to clean it yourself.

- Blow off the dust on the surface of the image sensor with a commercially available blower brush. Be careful not to blow too strongly.
- Do not put the blower brush further inside than the lens mount.
- Do not let the blower brush touch the image sensor as the image sensor may get scratched.
- Do not use any objects except a blower brush to clean the image sensor.
- If you cannot remove the dirt or dust with the blower, consult the dealer or Panasonic.

For care of the eye cup on the viewfinder

- If the eye cup becomes dirty, detach it from the camera body, gently wipe off the dirt with a soft, dry cloth, and then reattach it to the camera body.
- Be careful not to lose the eye cup.
- Keep the eye cup out of reach of children to prevent swallowing.



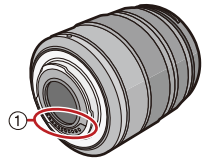
About the Monitor/Viewfinder

- Do not press the monitor with excessive force. Uneven colors may appear on the monitor and it may malfunction.
- If the camera is cold when you turn it on, the picture on the Monitor/Viewfinder will be slightly darker than usual at first. However, the picture will return to normal brightness when the internal temperature of the camera increases.

Extremely high precision technology is employed to produce the Monitor/Viewfinder screen. However there may be some dark or bright spots (red, blue or green) on the screen. This is not a malfunction. Though the Monitor/Viewfinder screen parts are produced with highly controlled precision technology, some pixels may be inactive or always lit. The spots will not be recorded on pictures on a card.

About the Lens

- Do not press the lens with excessive force.
- Do not leave the camera with the lens facing the sun as rays of light from the sun may cause it to malfunction. Also, be careful when placing the camera outside or near a window.
- When there is dirt (water, oil, and fingerprints, etc.) on the surface of the lens, the picture may be affected. Lightly wipe the surface of the lens with a soft, dry cloth before and after taking pictures.
- Do not place the lens mount facing downwards. Do not allow the lens mount contacts ① to become dirty.
- To improve the dust- and splash-proof performance, the mount of the interchangeable lens (H-HS12035) is embedded with the lens mount rubber. If you change the lens repeatedly, friction with the lens mount rubber may leave scratches on the camera's mount. However, those scratches do not affect the performance of this unit. For the replacement of the lens mount rubber, contact Panasonic.



Battery

The battery is a rechargeable lithium ion battery. Its ability to generate power comes from the chemical reaction that takes place inside it. This reaction is susceptible to the surrounding temperature and humidity. If the temperature is too high or too low, the operating time of the battery will become shorter.

Always remove the battery after use.
- Place the removed battery in a plastic bag, and store or keep away from metallic objects (clips, etc.).

If you drop the battery accidentally, check to see if the body of the battery and the terminals are damaged.
- Inserting a damaged battery in the camera will damage the camera.

Bring charged spare batteries when going out.
- Be aware that the operating time of the battery becomes shorter in low temperature conditions such as at a ski resort.
- When you travel, do not forget to bring the battery charger (supplied) and the AC mains lead (supplied) so that you can charge the battery in the country that you are traveling in.

Dispose of unusable battery.
- The battery has a limited life.
- Do not throw the battery into fire because it may cause an explosion.
- The unusable battery should be discarded in accordance with battery recycling laws. Call the RBRC hotline at 1-800-822-8837 for information.

Do not allow battery terminals to come into contact with metal objects (such as necklaces, hairpins, etc.).
- This can cause short-circuiting or heat generation and you may be badly burned if you touch a battery.

Charger

- The [CHARGE] indicator may blink under the influence of static electricity or electromagnetic wave. This phenomenon has no effects on charging.
- If you use the battery charger near a radio, the radio reception may be disturbed.
- Keep the charger 1 m (3.3 feet) or more away from radio.
- The charger may generate whirring sounds when it is being used. This is not a malfunction.
- After use, be sure to disconnect the power supply device from the electrical outlet. (A very small amount of current is consumed if it is left connected.)
- Keep the terminals of the charger and battery clean.

About 3D

About 3D recording

With the 3D interchangeable lens attached, do not record a subject at less than the minimum focus distance.

- The 3D effects may be more pronounced, and therefore cause tiredness or discomfort.
- When the 3D interchangeable lens (H-FT012: optional) is used, the minimum focus distance is 0.6 m (2.0 feet).

When recording with the 3D interchangeable lens attached, be careful not to shake the unit.

- Tiredness or discomfort may result if the shake is pronounced, due to riding in a vehicle or walking etc.
- We recommend using a tripod.

About 3D viewing

Anyone who is hyper sensitive to light, suffers from heart disease or is otherwise unwell should avoid viewing 3D pictures.

- Doing may have an adverse affect on such medical conditions.

If you feel tired, uncomfortable or otherwise strange when viewing 3D pictures, stop viewing at once.

- Continuing to view may cause illness.
- Please rest appropriately after stopping the viewing.

When viewing 3D pictures, we recommend taking a break every 30 to 60 minutes.

- Viewing for extended periods may cause eye-fatigue.

Short-sighted or long-sighted persons, those with differences in the sight of their right and left eyes, and those with astigmatism are advised to correct their vision by wearing glasses etc.

Stop viewing if you can clearly see a double image while viewing 3D pictures.

- There are differences in the way that different people experience 3D pictures. Please correct your sight appropriately before viewing 3D pictures.
- You can change the 3D setting of your television or 3D output setting of the unit to 2D.

Card

Do not leave the card where the temperature is high, where electromagnetic waves or static electricity are easily generated or exposed to direct sunlight.
Do not bend or drop the card.
- The card may be damaged or the recorded content may be damaged or deleted.
- Put the card in the card case or the storage bag after use and when storing or carrying the card.
- Do not allow dirt, dust, or water to get into the terminals on the back of the card and do not touch the terminals with your fingers.

Notice for when transferring to another party, or disposing of the memory card
- "Format" or "delete" using the camera or a PC will only modify the file management information, it will not erase the data in the memory card completely.
 It is recommended to physically destroy the memory card or use the commercially available computer data deletion software to completely erase the data in the memory card before transferring to another party or disposing.
 Management of data in the memory card is the responsibility of the user.

About the personal information

Setting a Wi-Fi password is recommended to protect personal information. (P245)
If a name or birthday is set for [Profile Setup]/Face Recognition function, this personal information is kept in the camera and recorded in the image.

Disclaimer
- Information including personal information may be altered or vanish due to erroneous operation, effect of static electricity, accident, malfunction, repair, or other handlings.
 Please note in advance that Panasonic is not liable in any way for any direct or indirect damage from the alteration or vanishing of information or personal information.

When requesting a repair, transferring to another party, or disposing.
- After making a copy of personal information, always delete information such as personal information and wireless LAN connection settings that you have saved within the camera with [Reset Wi-Fi Settings]/[Delete account] (P52, 242).
- Reset the settings to protect the personal information. (P51)
- Remove the memory card from the camera when requesting a repair.
- Settings may return to factory default when camera is repaired.
- Please contact the dealer where you purchased the camera or Panasonic if above operations are not possible due to malfunction.

When transferring to another party, or disposing of the memory card, please refer to "Notice for when transferring to another party, or disposing of the memory card" above.

When not using the camera for a long period of time

- Store the battery in a cool and dry place with a relatively stable temperature: [Recommended temperature: 15 °C to 25 °C (59 °F to 77 °F), Recommended humidity: 40%RH to 60%RH]
- Always remove the battery and the card from the camera.
- If the battery is left inserted in the camera, it will discharge even if the camera is turned off. If the battery continues to be left in the camera, it will discharge excessively and may become unusable even if charged.
- When storing the battery for a long period of time, we recommend charging it once a year. Remove the battery from the camera and store it again after it has completely discharged.
- We recommend storing the camera with a desiccant (silica gel) when you keep it in a closet or a cabinet.
- **Check all the parts before taking pictures when you have not used the camera for a long period of time.**

About the picture data

- Recorded data may be damaged or lost if the camera breaks down due to inappropriate handling. Panasonic will not be liable for any damage caused due to loss of recorded data.

About tripods or unipods

- When you use a tripod, make sure the tripod is stable when this unit is attached to it.
- You may not be able to remove the card or the battery when using a tripod or unipod.
- Make sure that the screw on the tripod or unipod is not at an angle when attaching or detaching the camera. You may damage the screw on the camera if you use excessive force when turning it. Also, the camera body and the rating label may be damaged or scratched if the camera is attached too tightly to the tripod or unipod.
- When using this unit with a large-diameter lens, the lens may come into contact with the pedestal depending on the tripod/unipod. Tightening the screw with the lens and pedestal in contact with each other may damage this unit or the lens. Therefore it is recommended to attach the tripod adaptor (DMW-TA1: optional) before mounting on the tripod/unipod.
- Read the operating instructions for the tripod or unipod carefully.

About the shoulder strap

- If you attach a heavy interchangeable lens (more than about 1 kg/35.0 oz) to the camera body, do not carry the camera by the shoulder strap. Hold the camera and the lens when carrying them.

- G MICRO SYSTEM is a lens exchange type digital camera system of LUMIX based on a Micro Four Thirds System standard.
- Micro Four Thirds™ and Micro Four Thirds Logo marks are trademarks or registered trademarks of Olympus Imaging Corporation, in Japan, the United States, the European Union and other countries.
- Four Thirds™ and Four Thirds Logo marks are trademarks or registered trademarks of Olympus Imaging Corporation, in Japan, the United States, the European Union and other countries.
- SDXC Logo is a trademark of SD-3C, LLC.
- “AVCHD”, “AVCHD Progressive” and the “AVCHD Progressive” logo are trademarks of Panasonic Corporation and Sony Corporation.
- Manufactured under license from Dolby Laboratories. Dolby and the double-D symbol are trademarks of Dolby Laboratories.
- HDMI, the HDMI Logo, and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries.
- HDAVI Control™ is a trademark of Panasonic Corporation.
- Adobe is a trademark or registered trademark of Adobe Systems Incorporated in the United States and/or other countries.
- iMovie, Mac and Mac OS are trademarks of Apple Inc., registered in the U.S. and other countries.
- App Store is a service mark of Apple Inc.
- Windows and Windows Vista are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

AVCHD™ Progressive

DOLBY DIGITAL

HDMI

PictBridge

USB LAN WLAN
✓ – ✓



- QuickTime and the QuickTime logo are trademarks or registered trademarks of Apple Inc., used under license therefrom.
- Android and Google Play are trademarks or registered trademarks of Google Inc.
- YouTube is a trademark of Google Inc.
- Facebook® is a trademark of Facebook, Inc.
- The Wi-Fi CERTIFIED Logo is a certification mark of the Wi-Fi Alliance.
- The Wi-Fi Protected Setup Mark is a mark of the Wi-Fi Alliance.
- “Wi-Fi”, “Wi-Fi Protected Setup”, “Wi-Fi Direct”, “WPA” and “WPA2” are marks or registered marks of the Wi-Fi Alliance.
- DLNA, the DLNA Logo and DLNA CERTIFIED are trademarks, service marks, or certification marks of the Digital Living Network Alliance.
- This product uses “DynaFont” from DynaComware Corporation. DynaFont is a registered trademark of DynaComware Taiwan Inc.
- Other names of systems and products mentioned in these instructions are usually the registered trademarks or trademarks of the manufacturers who developed the system or product concerned.

This product is licensed under the AVC patent portfolio license for the personal and non-commercial use of a consumer to (i) encode video in compliance with the AVC Standard (“AVC Video”) and/or (ii) decode AVC Video that was encoded by a consumer engaged in a personal and non-commercial activity and/or was obtained from a video provider licensed to provide AVC Video. No license is granted or shall be implied for any other use. Additional information may be obtained from MPEG LA, LLC. See http://www.mpegla.com .

This product incorporates the following software:
(1) the software developed independently by or for Panasonic Corporation,
(2) the software owned by third party and licensed to Panasonic Corporation and/or,
(3) open sourced software including the software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/), and the software written by Eric Young (eay@cryptsoft.com).

This product contains OpenSSL software developed by the OpenSSL Project, and can be used under the following licencing conditions.

LICENSE ISSUES

The OpenSSL toolkit stays under a dual license, i.e. both the conditions of the OpenSSL License and the original SSLeay license apply to the toolkit. See below for the actual license texts. Actually both licenses are BSD-style Open Source licenses. In case of any license issues related to OpenSSL please contact openssl-core@openssl.org.

OpenSSL License

Copyright (c) 1998-2004 The OpenSSL Project. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgment:
 "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org.
5. Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.
6. Redistributions of any form whatsoever must retain the following acknowledgment:
 "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/)"

THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product includes cryptographic software written by Eric Young (eay@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com).

Original SSLeay License

Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
All rights reserved.

This package is an SSL implementation written by Eric Young (eay@cryptsoft.com).
The implementation was written so as to conform with Netscapes SSL.

This library is free for commercial and non-commercial use as long as the following conditions are adhered to. The following conditions apply to all code found in this distribution, be it the RC4, RSA, lhash, DES, etc., code; not just the SSL code. The SSL documentation included with this distribution is covered by the same copyright terms except that the holder is Tim Hudson (tjh@cryptsoft.com).

Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed. If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used. This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgement:
 "This product includes cryptographic software written by Eric Young (eay@cryptsoft.com)"
 The word 'cryptographic' can be left out if the routines from the library being used are not cryptographic related :-).
4. If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement:
 "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"

THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The license and distribution terms for any publically available version or derivative of this code cannot be changed. i.e. this code cannot simply be copied and put under another distribution license [including the GNU Public License.]

This product contains encryption software developed by Eric Young, and can be used under the following licencing conditions.

Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
All rights reserved.

This package is an SSL implementation written by Eric Young (eay@cryptsoft.com).
The implementation was written so as to conform with Netscapes SSL.

This library is free for commercial and non-commercial use as long as the following conditions are adhered to. The following conditions apply to all code found in this distribution, be it the RC4, RSA, lhash, DES, etc., code; not just the SSL code. The SSL documentation included with this distribution is covered by the same copyright terms except that the holder is Tim Hudson (tjh@cryptsoft.com).

Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed. If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used. This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgement:
 "This product includes cryptographic software written by Eric Young (eay@cryptsoft.com)"
 The word 'cryptographic' can be left out if the routines from the library being used are not cryptographic related :-).
4. If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement:
 "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"

THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The license and distribution terms for any publically available version or derivative of this code cannot be changed. i.e. this code cannot simply be copied and put under another distribution license [including the GNU Public License.]

This product contains NetBSD software, and can be used under the following licencing conditions.

Copyright (c) 1990 The Regents of the University of California. All rights reserved.

This code is derived from software contributed to Berkeley by Chris Torek.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product contains OpenSSL software developed by the OpenSSL Project, and can be used under the following licencing conditions.

Copyright (c) 1999-2002 The OpenSSL Project. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgment:
 "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact licensing@OpenSSL.org.
5. Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.
6. Redistributions of any form whatsoever must retain the following acknowledgment:
 "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"

THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product includes cryptographic software written by Eric Young (eay@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com).

This product contains encryption software developed by Eric Young, and can be used under the following licencing conditions.

Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
All rights reserved.

This package is an SSL implementation written by Eric Young (eay@cryptsoft.com).
The implementation was written so as to conform with Netscapes SSL.

This library is free for commercial and non-commercial use as long as the following conditions are adhered to. The following conditions apply to all code found in this distribution, be it the RC4, RSA, lhash, DES, etc., code; not just the SSL code. The SSL documentation included with this distribution is covered by the same copyright terms except that the holder is Tim Hudson (tjh@cryptsoft.com).

Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed. If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used. This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgement:
 "This product includes cryptographic software written by Eric Young (eay@cryptsoft.com)"
 The word 'cryptographic' can be left out if the routines from the library being used are not cryptographic related :-).
4. If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement:
 "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"

THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The license and distribution terms for any publically available version or derivative of this code cannot be changed. i.e. this code cannot simply be copied and put under another distribution license [including the GNU Public License.]

This product contains NetBSD software, and can be used under the following licencing conditions.

Copyright (c) 1990 The Regents of the University of California.
All rights reserved.

This code is derived from software contributed to Berkeley by Chris Torek.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product contains NetBSD software, and can be used under the following licencing conditions.

Copyright (c) 1989 The Regents of the University of California.
All rights reserved.

This code is derived from software contributed to Berkeley by Tom Truscott.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgement:
 This product includes software developed by the University of California, Berkeley and its contributors.
4. Neither the name of the University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product contains NetBSD software, and can be used under the following licencing conditions.

Copyright (c) 1990, 1993
The Regents of the University of California. All rights reserved.

This code is derived from software contributed to Berkeley by Chris Torek.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product contains XML parser library, and can be used under the following licencing conditions.

Copyright (c) 1998, 1999, 2000 Thai Open Source Software Center Ltd

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.